THE AUTOMOBILE

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HOW THE GREAT HERKOMER WAS STARTED

BY W. F. BRADLEY.

FRANKFORT-ON-THE-MAIN, June 6.—An entry list of 156 touring cars, and 134 actual starters, made the town of Frankfort alive with automobiles to-day, the occasion of the second contest for the Herkomer cup. Among the 134 were to be seen the finest cars Europe can produce. It was not a collection of racers, but of handsome touring vehicles of considerable horsepower, fitted with luxurious bodies. Germany had the greatest representation, as was befitting; France, Italy, and Austria had their most important representatives there; England had an aristocratic team of gentlemen drivers, all with Daimler machines, and America was pluckily represented by Percy Pierce with a Pierce-Arrow touring car of 40-45 horsepower.

The royal patronage given to the contest is largely responsible for the bumper entry, for not only is the Emperor to inspect the machines on their passage through Vienna, but Prince Henry of Prussia is himself driving a 40 horsepower Benz. The Herkomer cup contest is, further, the only automobile event in which the amateur driver can expect to compete with equal chances against the professional.

The contest is run over a total distance of 1,000 miles, and occupies one week. The stages are: June 6, Frankfort-on-the-Main to Munich, 403 kilometers; June 7, Munich to Linz, 269 kilometers; June 8, Linz to Vienna, 185 kilometers; June 10, Vienna to Klagenfurt, 308 kilometers; June 11, Klagenfurt to Inns-

GENERALVIEW OF THE START OF THE HERKOMER CUP RACE AT FRANKFORT, GERMANY.

JULIUS BEUTLER IN 40-HORSEPOWER MARTINI.

bruck, 331 kilometers; and June 12, Innsbruck to Munich, 140 kilometers.

An exhibition will take place at Vienna on June 9 of all the cars taking part in the contest, and on June 13 the prizes will be distributed at Munich.

A hill-climbing competition will be held at Semmering on June 10, the rise being 500 meters in seven kilometers. On June 12 a speed competition will be held in the Forstenrieder Park. During the hill climb and speed test the autos must be driven by their owners. During the rest of the journey the chauffeur may drive, but the owner must always be on board. A commissaire is carried on each car to see that the regulations are observed, and at the end of each stage the machines must be handed over to the person in charge of the control station.

Scenes of Interest at the Starting Line.

The greatest animation reigned at the starting line on the borders of Frankfort when at 5 o'clock the mass of autos made music with their horns and exhausts. Prince Henry of Prussia received his share of popular applause, and as well-known motorists went away cheers and cries in various tongues followed them. At the outset protests were lodged against the scanty bodywork of some of the competitors, the Fiat cars which ran in the Milan Golden Cup contest being especially objected to on this account. After much discussion the Italians had to withdraw, but finally decided to run in the contest, although not officially recognized as competitors.

Benz and Daimler machines are the favorites. Sorel, winner of the Pyrenees Cup, with a 24-horsepower De Dietrich is looked upon as the champion of the French team, and the English squad, among which is one lady, Mrs. Edward Manville, is known to have sworn to win or die. The solitary Pierce car attracted considerable attention by reason of its being the first American machine to compete in a European touring contest. The winner of the cup last year, Edgar Ladenburg, was unfortunately unable to start owing to his machine having been seriously damaged in a collision in Frankfort as he was making for the starting line.

PRINCE HENRY OF PRUSSIA IN 40-HORSEPOWER BENZ.

The organization of the contest is all that the most fastidious could desire. The road is guarded by soldiers, and at various distances are men with flags to point out the route and signal dangerous points. A blue flag indicates a dangerous portion of the road, a yellow flag indicates danger necessitating a stoppage. A member of the royal family is on board one of the cars, and as it is impossible to distinguish his highness under goggles and automobile clothing, respect is shown to all the competitors; stones never fly. The German roads are not everywhere as perfect as the German organization, but this will only more thoroughly test the cars, and the American competitor will certainly not grumble at having to run over rough surfaces.

CABLE REPORTS OF HERKOMER WINNERS.

Starting last in the Herkomer competition, after 154 cars had set out on the journey, Dr. Robert Stoess, of Zwickau, was awarded the first prize, to the astonishment of all contestants and spectators. His machine was of only 20 horsepower. Second prize went to Emil Neumaler, of Stuttgart, who drove a 40-horsepower car, and third prize to Herr Willy Poge, of Chemnitz, with a 40-horsepower car. The cablegrams do not state the makes of the winning cars. Percy Pierce, driving the only American car in the event, a 40-45-horsepower Pierce Arrow, is not named among the first ten, nor was Prince Henry of Prussia. Advices from Mr. Pierce state that his car made a clean record for the tour. In the absence of definite information, it is thought that the car was handicapped in the speed trials which were a part of the Herkomer contest, because of the high power of many of the continental cars, and that beauty of contour, which was also a factor, was considered from a continental standpoint, to the detriment of the American competitor's chances.

CHARLES HARDY IN 45-HORSEPOWER DAIMLER.

Cable information from English sources states that three of the Herkomer prizes were carried off by English Daimler cars. One of these, a 35-40-horsepower car, was driven by Mrs. Manville, an Englishwoman, and was awarded a prize of honor. Another, of 28-36 horsepower, driven by Mr. Grigg, received a gold medal, while a third, driven by Lord Montagu, also received a gold medal.

Two accidents have been reported. Curiously enough, in both cases the cars concerned were rounding curves near Nuremberg on the first day and each struck a tree; in each case an occupant of the car was thrown out and his skull fractured. One of the men injured was an official observer. Arthur Blackburn, an English competitor, was forced to abandon the contest on the first day, owing to the disablement of his car.

ROCHET-SCHNEIDER TOURING CONTEST.

PARIS, June 6.—Some additional interest was attracted to the third annual contest for the Rochet-Schneider trophy by reason of its being held over the famous circuit on which last year's Gordon Bennett race was run. The difficult nature of the road was so much talked about at that time for its horseshoe curves on steep grades, stiff climbs and long, winding descents as to be still familiar to all; and it was on this wild mountain course that the tourists had to prove their mettle, 300 points being awarded for regularity of running, 200 points each for fuel consumption, hill-climbing power, highest average speed, price of chassis, and 100 points for water consumption.

Nineteen cars started, consisting of two Peugeots, one Brouhot, two Bayard-Clements, three Heralds, four Rochet-Schneiders, two Mieussets, three La Buire, and two Pilains, eighteen of which officially finished the 198 miles run. Perret on a Peugeot machine headed the list with the maximum number of points, 1,200, and thus secured the cup for the second year in succession. The winner's fuel consumption was 2.57 gallons for 62 1-2 miles. For the total run the fuel consumption was 5.8 gallons. The importance of this performance will be realized when it is remembered that the 198 miles consisted of difficult mountain roads with several 13 per cent. grades. The Bayard-Clement cars also made a good showing on the fuel consumption test, their record being 8.1 gallons for 198 miles, covered at an average of 19 miles

BRANDON IN 40-HORSEPOWER OPEL-DARRACQ.

an hour, and 2.55 gallons for the 62 1-2 miles on which the fuel consumption was officially controlled. This latter portion covered the famous La Baraque hill, four kilometers of which have a 13 per cent. grade.

So keen was the competition that it was only the fuel consumption and catalogue price which determined the classification. For regularity of running, hill climbing, and loss of water, the competitors formed a compact group.

The hill-climbing test was held over a four-kilometer course to be covered at a speed of 18 3-4 miles an hour. Two hundred points were awarded for this, while failure called for the deduction of points.

PERCY PIERCE IN A SERIOUS COLLISION.

After having passed through the Herkomer competition with a fine record, Percy Pierce, of Buffalo, the only American competitor in the event, collided with a carriage while returning from the contest, at Wertheim, near Frankfort. Two men were in the carriage, and one was killed and the other injured seriously. The automobile was much damaged.

Mr. Pierce and an American friend, Mr. Custrey, who was with him in the car, were detained, and will remain at a hotel in a neighboring town until the amount of their bail shall have been fixed by the authorities.

PERCY MARTIN IN 35-HORSEPOWER LEON BOLLEE.

MORNING PAPERS AT THE GRAND PRIX.

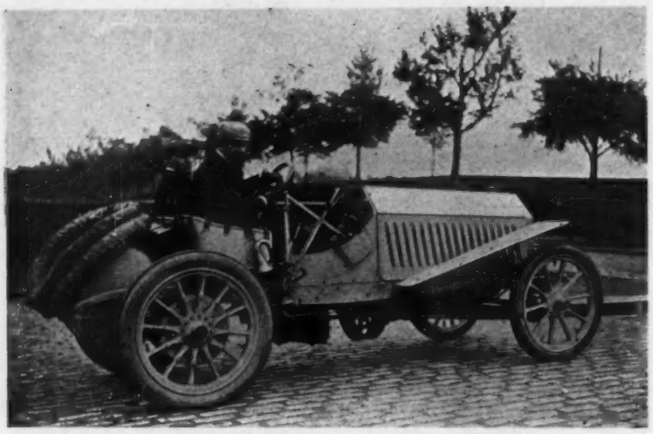
Duplicating the exploit of last year, several leading Paris dailies will be delivered in the early hours of the morning on the course of the Grand Prix race of the Automobile Club of France. This year the Paris edition of the *Herald* undertakes the enterprise in connection with *Le Matin*, a representative French daily. The distance between Paris and Le Mans is 210 kilometers. The vehicle chosen for the fast delivery is a 60-horsepower Mercedes, especially equipped by C. L. Charley, the "Mercedes man," of Paris. Paul Sartori will be the driver. He expects to make the run in about three hours, that is, leaving Paris at the Porte Mailot gate at 4 o'clock in the morning, and reach Le Mans at about 7 o'clock. On the different points of the course, at La Fourche, at Bonneval, at Connerre, scores of cyclists will be ready to take bundles of papers and distribute them in their respective districts.

Everybody remembers how successful was the first attempt made last year when the fashionable sea places, Deauville and Trouville, were supplied with the newspaper before breakfast time. At Le Mans, as well as on the French coast, the newspaper trains do not arrive before the early afternoon.

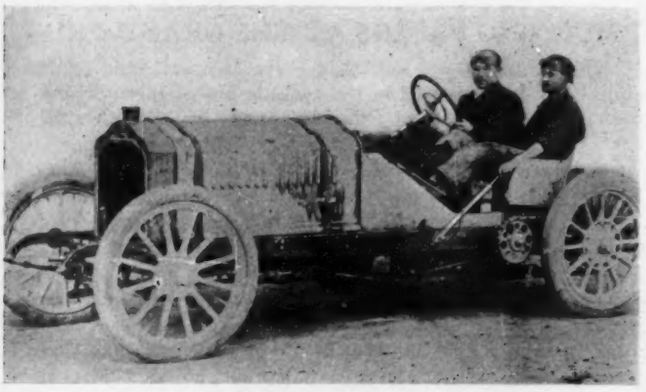
NO EUROPEAN CIRCUIT THIS YEAR.

It is now certain that the European Circuit touring contest will not be held this year. All the national clubs interested in the event have agreed to the proposition of the German Imperial Automobile Club to postpone the tour until next year. The matter has yet to be submitted to the Automobile Club of France for sanction, but this is only a formality, and all entries have been canceled and engagement fees refunded.

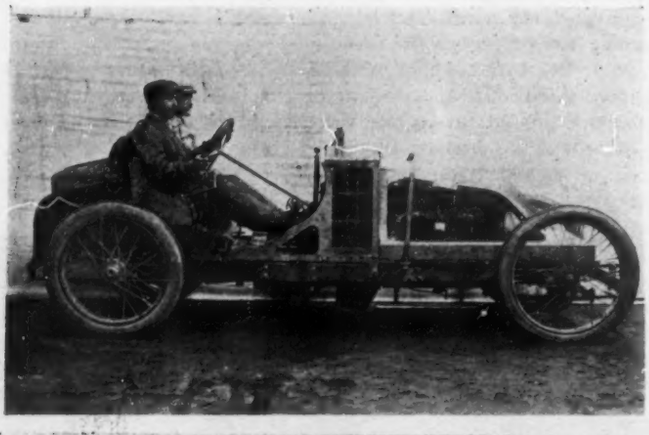
HERR BRAUNBECK IN 35-HORSEPOWER MERCEDES.



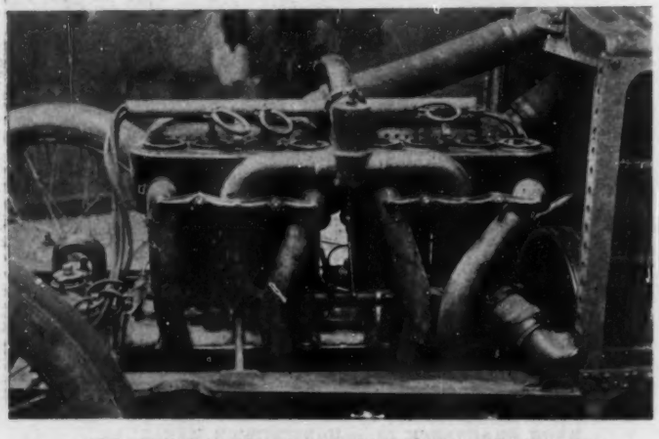
PANHARD TESTING THE GRAND PRIX COURSE.



DURAY IN 130-HORSEPOWER DE DIETRICH.



SZISZ IN HIS WIRE-WHEELED RENAULT.



110-H.P. RENAULT MOTOR, THERMO-SIPHON CIRCULATION.

BEFORE THE GRAND PRIX.

Just received from our Paris correspondent, the following specifications on the two Gregoire cars that are said to have a splendid chance in the Grand Prix will prove interesting: Bore, 140 mm.; stroke, 130; indicated power, 70-horsepower; flat tubes radiator, thermo-siphon cooling system, straight cone clutch with bolts, coupling rod before the front axle; diameter of wheels—front 810x90; rear, 820x120. Cardan shaft transmission; 130 liters gasoline tank. The machine weighs 750 kilos. Ignition by Nilmelior magneto with plugs and transformators. Shock absorbers Gardy-Batault, working in oil.

Albert Clement is now through with his trials on the Grand Prix course. In a letter just received here by a friend of his, the young driver says he is perfectly delighted with his machine. His special Bayard-Clement racer has withstood a series of trips of four to five hundred miles, without a screw loosening. The car is exceedingly fast and covers the kilometer in less than 23 seconds. It is also extremely strong, and the cooling is perfect. Albert Clement, Villemain, and de la Touloubre, the three stars of the Clement-Bayard team, are said to have covered the kilometer several times between 22 and 23 seconds.

The tarring of the road is completely finished at the time of writing. The Automobile Club of France's grandstand is in course of construction, and expected to be erected by June 22. The work of the tunnel that passes under the Paris road at the hectometrique stone No. 32, and which gives access to the stands, is already finished. The stands in Saint-Mars-la-Briere and Champagne will also be ready early. At the La Fourche turn the cement-raised bank is completed.

The following are important features culled from the rules edicted by the Sportive Commission of the A. C. F. June 7, relative to the weighing in of the cars and formalities in the "closed parks" between the two stages of the race:

1.—The cars must be at the scale on June 24 from 9 o'clock in the morning to 7 o'clock at night.

2.—They shall be accompanied by the team competing in the first day of the race.

3.—The car must be brought in complete readiness.

4.—The weight of the car, all tanks empty, shall not exceed 1,000 kilos, 7 kilos in excess being tolerated as stipulated in Article 12 of the rules. (Magneto).

5.—If the passengers (driver and mechanician) do not weigh the stipulated 120 kilos, the difference will be completed by means of a sack of sand closed by a lead seal bearing the name of the driver. The driver will be requested to show the sack with the lead seal bearing his name at the time of the two starts.

6.—The tires on the wheels will be marked with a hot iron as well as all those fixed on the car.

7.—The chassis will be marked by means of a steel stamp and a hammer on the four wheels (hubs and one spike); on the left rear hand spring, on the right front hand spring, and on the top and underneath the gear case.

8.—A competitor will be obliged, after having filled his tanks, to operate the car before the commissaires. A few yards forward and a few yards backward will be required for that examination.

9.—A competitor will be obliged to crank his motor and make it work at full admission (throttle wide open) before the commissaires during a few minutes, and if the exhaustion blows away the sawdust placed underneath the motor, the driver will not be permitted to start.

10.—Every driver will be compelled to produce a certificate signed by the clerk of the course and attesting that he knows the circuit entirely.

11.—The number will be painted in a very apparent manner on the radiator, at the front, and on the tank, at the rear, and must be visible at the distance of at least 150 meters.

12.—Every car having completed the distance under the limit time, the first day, will be immediately taken into the custody of a commissaire, who will cause it to be brought by hand into its special stall in the closed park and locked so that nobody will be permitted to approach it.

13.—As soon as his motor is stopped the driver will be authorized to do only one thing, that is shut his gasoline and oil cocks, and then leave his car in the care of the commissaires.

14.—On the morning of the second day the cars will be remitted in the hands of their respective teams at the instant of the start only.

15.—All operations relative to the cranking of the motor, general supply, repairs, etc., will not be allowed to be effected before the start is given.

16.—At the end of the second day, the competitor having finished under the limit time, and, consequently, fit for classification, will leave his car in the care of the appointed commissaires, who will inspect it all over, weigh it, and conduct it to the closed park.

Messrs. Rene de Knyff, de Vogue, Loysel, and de la Valette were this week in Le Mans, where they had a conference with the Prefect of La Sarthe regarding the definite text of the report to be addressed to the Minister of Interior, M. Etienne Giraud.

LONG ISLANDERS HOLD THEIR ECONOMY TEST

MUD, rain, steep hills and miserable roads made the second reliability and economy contest of the Long Island Automobile Club, of Brooklyn, a run to be remembered and talked about for many a day. The showing made by the competing cars was exceptionally good, the machines plowing through the mud and driving through the storm without hesitation. For the most part it was anything but a pleasure trip, and those who competed must have been animated by a spirit of true devotion to the sport.

S. H. BURNS IN 24-H.P. PACKARD, WINNER OF FIRST PRIZE.

Fifteen Cars Started.

On Saturday morning fifteen cars started from Cumberland street, Brooklyn, for the two days' trip of 173 miles to Poughkeepsie and return. There were twenty entries, but five did not start. Ten cars finished the run. The starters were as follows:

A. WILMARTH IN 40-H.P. ROYAL TOURIST, WINNER SECOND.

Alfred Wilmarth and Wm. Schimpf, 40-horsepower Royal Tourists; W. T. Wintringham and B. W. Bergen, 20-horsepower Stevens-Duryeas; Dr. Clinton B. Parker and S. H. Burns, 24-horsepower Packards; Raymond Healy, 50-horsepower Zust; George A. Fisher, 28-horsepower National; V. F. Parker, 20-horsepower Locomobile; J. E. Bristol and Frederick Lampe, 40-horsepower Pierce-Arrows; E. W. Messereau, 24-horsepower Autocar; Dr. William E. Butler, 20-horsepower Frayer-Miller; Leffert Lefferts, 24-horsepower Pope-Toledo, and C. Jerome Edwards, 30-horsepower Cadillac.

Four Cars Disqualified.

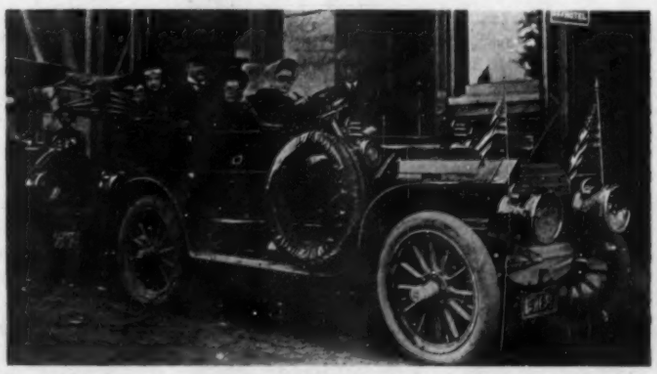
Four cars that finished the run were disqualified: J. E. Bristol's Pierce-Arrow, Dr. Butler's Frayer-Miller, Raymond Healy's Zust and William T. Wintringham's Stevens-Duryea. The first three were disqualified because they failed to obey the rule of the contest which stipulated that all cars should be driven by their owners. The fourth, Mr. Wintringham's Stevens-Duryea, broke a spring which was not replaced. The disqualification of the Pierce Arrow was peculiarly unfortunate, for that car made the most economical run per passenger, as the summaries show, and also led the cars both going and coming. The owner could not drive, owing to an injured wrist. The silver loving-cup donated by Dr. C. B. Parker, winner of last year's economy contest, was captured by S. H. Burns, whose 24-horsepower Packard covered the entire route without a hitch and without repairs of any kind. Second prize, a speed indicator, was won by Alfred Wilmarth, president of the Long Island Automobile Club, whose 40-horsepower Royal Tourist also came through with an absolutely clean record.

The route was from Brooklyn to Manhattan, through Jerome avenue to Yonkers, Peekskill and Fishkill to Poughkeepsie, returning by way of Fishkill, across the ferry to Newburgh, thence to Tuxedo and New York. Members not having a New Jersey license or not caring to pass through New Jersey, were allowed to return by the Fishkill-Peekskill-Yonkers route, as on the outward trip. The mileage of the two routes is about equal.

It was 11 o'clock before the last car had left Brooklyn for Poughkeepsie; Peekskill was scheduled for the luncheon stop. But between Yonkers and Peekskill a drenching downpour of rain was encountered. Roads were converted into rivers and the hills were veritable rapids and cataracts, but the machines went through it and ten of them arrived safe in Poughkeepsie before 10 o'clock Saturday night.

Homeward Bound.

On Sunday morning the return trip was started. Along the west side of the Hudson the roads were found to be in a most discouraging state as the result of the rain of the previous day. Mud was plentiful and tenacious and the cars were tested severely. Suffern was the luncheon stop on the home run. At Fishkill Landing the ferry was taken across the river to Newburgh. Immediately after leaving the ferry the cars were forced to climb an awkward hill with a very steep grade, but all got up in good shape. From Suffern the route led to Jersey City, where the ferry was taken to Brooklyn. Ten cars finished, and the records were as follows:



J. E. BRISTOL IN 40-45-HORSEPOWER PIERCE ARROW.

Summary of the Finish.

Pierce-Arrow, 40-45 horsepower; J. E. Bristol; 6 passengers; Brooklyn to Poughkeepsie; 8 gallons gasoline, $2; Poughkeepsie to Brooklyn, 8 gallons gasoline, $2; 1 pint oil, 8 cents; total, $2.08; grand total, $4.08; per capita cost, 81 3-5 cents. Disqualified because owner did not drive.

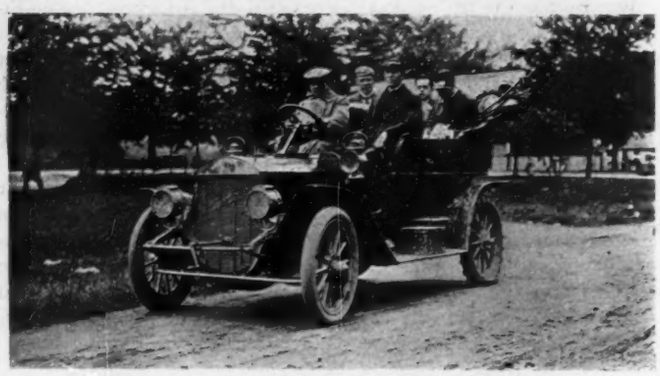
Packard, 24 horsepower; S. H. Burns; 5 passengers; Brooklyn to Poughkeepsie, 8 gallons gasoline, $2; Poughkeepsie to Brooklyn, 8 gallons gasoline, $2; 3 quarts oil, 45 cents; total, $2.45; grand total,

$4.45; per capita cost, 89 cents. Winner of first prize, offered by Dr. C. B. Parker.

Frayer-Miller, 24 horsepower; Dr. Wm. Butler; 5 passengers; Brooklyn to Poughkeepsie, 5 gallons gasoline, $1.25; work on motor, 15 cents; total, $1.40; Poughkeepsie to Brooklyn, 4 3-4 gallons gasoline, $1.18; 1 pint oil, 7 1-2 cents; 2 punctures and time, $1.80; total, $3.05 1-2; grand total, $4.45 1-2; per capita cost, 89 cents. Flat tire not replaced, although charged in expense account. Disqualified because owner did not drive.

Royal Tourist, 40 horsepower; Alfred Wilmarth; 5 passengers; Brooklyn to Poughkeepsie, 10 gallons gasoline, $2.50; Poughkeepsie to Brooklyn, 12 gallons gasoline, $3; 1 quart oil, 15 cents; grand total, $5.80; per capita cost, $1.16. Winner, record prize.

Autocar, 24 horsepower; E. W. Messereau; 5 passengers; Brooklyn to Poughkeepsie, 8 gallons gasoline, $2; puncture and time, $1.50;



DR. BUTLER IN 24-H.P. FRAYER-MILLER LEAVING SUFFERN.

oil, 25 cents; total, $3.75; Poughkeepsie to Brooklyn, 7 1-2 gallons gasoline, $1.87; 1 quart oil, 15 cents; grand total, $5.77; per capita cost, $1.15.

Pierce-Arrow, 30 horsepower; F. Lampe; 5 passengers; Brooklyn to Poughkeepsie, 11 gallons gasoline, $2.75; repairs, 60 cents; total, $3.35; Poughkeepsie to Brooklyn, 10 gallons gasoline, $2.50; 1 quart oil, 15 cents; total, $2.65; grand total, $6; per capita cost, $1.20.

Locomobile, 15-20 horsepower; V. F. Parker; 3 passengers; Brooklyn to Poughkeepsie, 5 gallons gasoline, $1.25; Poughkeepsie to Brooklyn, 10 gallons gasoline, $2.50; 3 1-2 pints oil, 25 cents; total, $2.75; grand total, $4; per capita cost, $1.33.

Packard, 24 horsepower; Dr. C. B. Parker; 4 passengers; Brooklyn to Poughkeepsie, 8 gallons gasoline, $2; Poughkeepsie to Brooklyn, 6 gallons gasoline, $1.50; 7-8 quart oil, 14 cents; tire and repairs, $1.35; total, $2.99; grand total, $4.99; per capita cost, $1.24; per capita cost for fuel and lubricant, 91 cents. Not competing for prize.

Zust, 50 horsepower; Raymond Healy; 5 passengers; Brooklyn to Poughkeepsie, 12 gallons gasoline, $3; Poughkeepsie to Brooklyn, 15 gallons gasoline, $3.75; grand total, $6.75; per capita cost, $1.35. Disqualified because owner did not drive.

Stevens-Duryea, 20 horsepower; William T. Wintringham; 4 passengers; Brooklyn to Poughkeepsie, 6 gallons gasoline, $1.50; Poughkeepsie to Brooklyn, 6 1-2 gallons gasoline, $1.62 1-2; 1 1-2 pints oil (entire trip), 12 cents; grand total, $3.24; per capita cost for fuel, 81 cents. Broken spring not replaced. Disqualified.

ILLUMINATED PARADE AT BUFFALO.

BUFFALO, N. Y., June 18.—Buffalo's annual automobile parade under the auspices of the Automobile Club of Buffalo, June 14, was a success in every way. More than 200 automobiles were in line, all of them prettily decorated. The start was made from the rooms of the Automobile Club at Main and Edward streets, and headed by President H. A. Meldrum the parade passed down Main street and through several of the more prominent streets, finally ending at Athletic Park, where the prizes were awarded. Then the autoists had a jolly good time at the expense of the management of the park.

Albert Poppenberg's Rambler was the winner of the first prize, a handsome silver loving cup, contributed by the park association. The car was decorated in white and was so arranged as to give the impression that the machine was drawn along by a swarm of butterflies. President Meldrum's car won second prize, a silver loving cup given by the Poppenberg Automobile Company, but Mr. Meldrum declined the prize, on the grounds of his official position, turning it over to Secretary D. H. Lewis, whose car came next. The Meldrum car presented an arbor hung with purple and white chrysanthemums, brilliantly lighted by purple and white electric lights. Among the passengers of the Meldrum car was Roy Knabenshue, the airship navigator. Special mention was awarded the cars of former President A. H. Knoll and George N. Dilfer.

AUTOMOBILE PARADE AT MERIDEN, CONN.

MERIDEN, CONN., June 18.—Last Tuesday was automobile day in this city, which was celebrating its 200th anniversary with "Old Home Week" exercises on an elaborate scale. In the procession were 165 automobiles, more than half of them gayly bedecked. Dr. F. L. Murdock's Thomas Flyer, which won first prize, was decorated with 20,000 paper peach blossoms entwined with twigs, which shot high in the air and completely covered the car. The second prize winner, W. A. Penfield's car, was adorned with a gigantic elk's head, the owner being a prominent member of the local B. P. O. E. The Elk color of purple was emblazoned all over the body of the car with massive bunches of violets, and purple ribbons connected the widespread antlers with the seat. I. L. Holt's car, which won third prize, was decorated with white chrysanthemums and a large gilt butterfly hovering over the headlights. The prizes were two large silver trays, a silver loving cup, and a large silver stein. The parade was probably the largest automobile street display ever made in Connecticut.

BALTIMORE'S AUTO TRANSPORTATION

BALTIMORE, June 18.—Alexander Brown & Sons, the well-known bankers of this city, are said to have acquired a controlling interest in the Automobile Outing Company, of which Richard Keating was formerly president. The name of the company has been changed to the Automobile Outing and Transportation Company. A Columbia electric phaeton, seating twelve persons, has been purchased, and will be used in Druid Hill Park. Another vehicle of the same kind is expected this week.

AN AUTOMOBILE FOR AN OWL ROOST.

DEKALB, ILL., June 18.—New uses are being found for the automobile every day, but who would think that the "whizzer" would be taken for an owl roost? That is just what happened to a Rambler machine that had been left under a big oak tree

FIVE OWLS WHO MADE A RAMBLER THEIR HEADQUARTERS.

on the campus of the Northern Illinois State Normal School near this place. The owner of the car is A. F. Rowley, a local photographer. When he approached his car and the situation was taken in by the surprised artist, he, for a moment, was at a loss to know just what to do, save that he made sure not to let the birds get away without leaving their picture.

GLIDDEN TOUR ARRANGEMENTS AND RULES

IN answer to a number of inquiries regarding accommodations on the third annual tour of the American Automobile Association (Glidden trophy contest), and inquiries regarding possible route discomforts, during the trip from Buffalo to Bretton Woods, on July 12-28, the officials have issued the following statement:

Arrangements have been made by the committee and superintendent by which provision has been made for a reservation of the entire transient accommodations in each place where the tour stops for the night. There is no place on the route where 400 tourists cannot be comfortably accommodated, and at several points as many as a thousand of the party can be adequately cared for. To accomplish this result it has been necessary to arrange for the erection of tents, portable houses, etc., at two points. In Canada arrangements are being made for the chartering of a large St. Lawrence river steamer, which will accompany the tour and will be used as a floating hotel.

Regarding possible congestion on the road and the danger of unpleasant dust conditions, members of the party which recently surveyed the road state that from Montreal to Bretton Woods there is practically no dust on the roads, on account of the prevailing heavy dews. On account of the necessity of making the day's runs as nearly equal as possible, the touring committee has decided that the first night's stop from Buffalo shall be at Auburn, and the second night's stop shall be at Utica. The most elaborate preparations are being made by the city of Auburn and the Auburn Automobile Club for the entertainment of the tourists, and at Utica there will also be special festivities on their account.

Pathfinding Car Will Be a Tour Feature.

Arrangements are now being made for a path-finding car which will precede the tour by about three days, and will thoroughly mark the entire route with arrows or other indicating signs, and will also carry a transportation agent, who will attend to the registration of the members of the party in each town. By these means the tourists, on their arrival at each night's stop, will find their rooms ready for them.

The committee will also institute a system of checking along the line, checkers being dropped by a patrol car at at least three points on each day's journey. These checkers will record the time that each car passes their checking points, the plan being to arrive at conclusions with regard to regularity of running throughout the tour. A second patrol car will follow the last tourist and will not only pick up the checkers left along the route, but will also act as a relief car, carrying word of possible breakdowns to the nearest towns and arranging for spare parts or tows if there should be any necessity of these.

The tender of a baggage wagon capable of carrying 2,500 pounds has been made by E. H. Cutler, president of the Knox Automobile Company, Springfield, Mass., and will undoubtedly be accepted by the committee. It is understood that other baggage wagons or trucks are to be offered, and the committee now feels that it will be in shape to handle the entire baggage of 400 or more tourists by automobile.

Arrangements have been made by which the customs problem (sometimes a perplexing one for tourists passing from the United States to Canada and back again) will be handled directly by the committee and entirely without expense to the members of the tour.

Official Entries Now Number Twelve.

An expected entry is that of Percy Pierce, who recently went through the Herkomer contest in a highly creditable manner. Owing to the postponement of the European Circuit, in which Mr. Pierce had entered his car, there is nothing to prevent his return to this country to defend the Glidden trophy, which he won last year. In addition to the six entries for the Glidden tour published in the last issue of THE AUTOMOBILE, the following have been nominated, making a total of twelve to date:

No. 7.—Geo. Otis Draper, Hopedale, Mass. Saratoga to Bretton Woods. Will not contest for Glidden Trophy. Two in party.

No. 8.—Ezra E. Kirk, c. o. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H.P. Five in party. Buffalo Automobile Club.

No. 9.—George M. Davis, c. o. E. R. Thomas Motor Co., 1200 Niagara Street, Buffalo, N. Y. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H.P. Five in party. Buffalo Automobile Club.

No. 10.—C. A. Coey, 1424 Michigan Ave., Chicago, Ill. Chicago to Bretton Woods. Will contest for Glidden Trophy. Thomas car of 50 H. P. Four in party. Chicago Automobile Club.

No. 11.—Albert A. Pope, c. o. Pope Manufacturing Co. Hartford, Conn. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pope-Toledo car of 35-40 H. P. Three in party. Automobile Club of America.

No. 12.—Albert L. Pope, c. o. Pope Manufacturing Co., Hartford, Conn. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pope-Hartford car of 25 H. P. Three in party. Automobile Club of Hartford.

Rules and Conditions Governing the Contest.

Concerning Entrants.

1. It will be assumed that every entrant is acquainted with these rules, and by entering for the tour agrees to abide by said rules, agrees to accept the official records, and authorizes the American Automobile Association to publish them in such manner as it shall determine.

2. Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management or control of the car entered by him.

3. It is one of the conditions upon which entries of cars are accepted by the American Automobile Association, that said American Automobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

Qualifications.

4. Each entrant shall be a member of the American Automobile Association or of a club recognized by it.

Entries.

5. The time for receiving entries will expire on July 3, 1906, at 12 o'clock noon, at the office of A. B. Tucker, Superintendent, 31 West Forty-second street, New York City. Each entry for the 1906 event must be accompanied by the regular fee of $50. Numbers for the tour will be issued in the order in which entries are received.

6. Each entrant shall give all details asked for in the entry blank.

7. The American Automobile Association reserves the right to refuse any entry.

Touring Conditions.

8. Each car entered shall be driven by the entrant, or by a driver or drivers nominated by him and approved by the committee; when the car is driven by other than the entrant, the latter shall ride in the car.

9. Cars must at all times during the tour have mufflers and mud guards and be equipped as per manufacturers' catalogue specifications, shall carry not less than four passengers of an average weight of 125 pounds, or their equivalent in ballast, and shall have touring car bodies with tonneau.

10. No replacements, replenishments, adjustments, repairs or inspection shall be made upon any car after the same shall have been registered at any night stop of the tour and before it shall have registered out on the next succeeding morning.

Number.

11. Each car shall have its official number prominently displayed on each side, or on front and rear.

12. No record of any previous performance, nor sign, or other indication of the maker's name, other than the nameplate, usually attached to the vehicle as sold to private owners, shall be displayed upon any car at any time during the progress of the tour.

Controls.

13. Cars shall be started each morning by officials of the tour between the hours of seven and ten o'clock A.M., but neither before or after the hours designated under penalty of disqualification, unless otherwise directed by the officials of the tour.

14. Each entrant shall, upon starting on each day's run, sign a statement submitted by an official of the tour fixing the hour of his departure from such control. Failure to comply will be sufficient ground for disqualification. Each day's tour shall be preceded by a pacemaker, designated by the committee, and any entrant who passes the pacemaker shall be disqualified. If the pacemaker breaks down or is compelled to travel at a rate of speed so low

as in the opinion of the committee to unduly impede the progress of the tour, his flag shall be transferred to the first car overtaking him, which car shall thereafter become pacemaker, subject to the same conditions.

Schedules.

15. The committee will publish a daily schedule fixing the exact time when each car may finish each day's run without penalty. Said schedule shall not require any entrant to operate his car at a higher rate of speed than is permitted by law. Each car failing to finish at the time fixed by the schedule shall be penalized one point for each minute required to complete said day's run in excess of the schedule time fixed by the committee. And a penalty of two points for each minute any car may finish any day's run earlier than the time fixed by said schedule shall be imposed against said car. And no car shall be allowed to stop en route for the purpose of meeting said schedule with exactitude, under penalty of disqualification.

16. The car having the lowest penalization shall be awarded the Glidden Trophy.

17. Each car must register at each night stop immediately on arrival at the place of registration and must take its place immediately behind the cars in front until it can be properly registered. Contestants for the Glidden Trophy shall, however, be entitled to precedence in registration over non-contestants.

18. Immediately following the registration at each night stop, each car shall be delivered into the custody of the officials of the tour, to be by them held at owner's risk, and kept under the direct charge and supervision of such officials or their agents until the hour for starting on the following morning, and no car shall be available for tuning up, adjustments, filling with gasoline or water, or for any other purpose, until after it shall have registered as starting on the next day's run of the tour.

Special Hill Climb or Tour.

19. If, upon arrival at the end of the tour, the committee finds that a hill climbing or touring course is available, it may arrange a special contest for the participants of the tour, if in the opinion of the committee such a contest is advisable or necessary to determine to which entrant the Glidden or other trophy or trophies should be awarded. In awarding the Glidden Trophy, credit will be given each car for its performance as a touring car, since the test is for the purpose of determining the touring qualifications of each contesting car. The committee may also select one or more special runs during the tour in order to complete a total of 1,000 miles.

Road Regulations.

20. Entrants must conform to all laws and ordinances and the rules of the road, and any entrant violating any of the provisions of these rules or of other rules adopted by the committee, or who shall fail to show due consideration toward other participants in the tour, or other users of the highways, may be disqualified by the committee.

21. Any car whose owner or driver shall be arrested for a violation of the speed limit laws, or of any law or ordinance, may, in the discretion of the committee, be disqualified.

Disqualification.

22. Upon due notice being served by the committee on the person in charge of any car that the same has been disqualified, it shall cease to run in the contest, and the official numbers shall be removed, it shall not receive any award or certificate, but shall be mentioned in the record as having been disqualified. But no notice of disqualification shall be served upon the person in charge of any car until he shall have been first notified of the act which it is claimed should disqualify the car; and if the act be denied, action shall be postponed until the committee shall have given the owner or person in charge of such car a hearing, when a decision shall be rendered. Neither the person whose car shall have been so disqualified or any entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the American Automobile Association or any member or members of the committee or any official of the tour because of disqualification or the publication of the fact, or the failure to mention the performance of the car disqualified prior to its disqualification.

Protests.

23. Any participant in the tour desiring to enter a protest must first deposit the sum of $10 with a member of the committee, which sum will be retained by the American Automobile Association if the protest is not sustained, and if the protest is sustained the protest fee shall be returned to the person making such deposit. All protests must be made in writing and will be considered by the committee at the earliest practicable moment and a decision rendered as soon as practicable thereafter.

24. (a) All protests as to entries must be made before the start.
(b) All protests as to unfair ruling, route, etc., must be made within twenty-four hours after the occurrence.
(c) All other protests shall be made during or immediately after the tour is concluded and before the award is made.

Powers of Committee.

25. The committee shall have power to disqualify any car for traveling at any speed which the committee may consider excessive under the conditions existing at the time, without reference to these rules.

26. The committee shall have power at all times to make such examinations of the cars entered and their contents as may be deemed advisable.

27. In the event of a dispute concerning the interpretation of the rules, the decision of the Touring Committee of the American Automobile Association shall be final.

28. Said Touring Committee reserves the right to alter or amend, suspend, or repeal these rules from time to time, down to and including the end of the tour and final award, as may in its judgment be deemed expedient.

Miscellaneous.

29. Rules 9, 10, 15, 16 and 18 shall not apply to non-contestants for the Glidden Trophy.

AUTO ADVICE OF THE OLD PARISIAN.

By GEORGE DUPUY.

These are the last words of the old Parisian automobile agent, directed to the son who is to succeed him in business:

"My son listen to this true aphorism: 'The customer is the enemy.'

"Remember that the English look at the transmission, the German at the motor and the American at the price. Then you must say to an Englishman, 'It is the most Robust of Gear Boxes;' to a German, 'It is the latest pattern in Motors;' to an American, 'It is the Highest Priced Car in the World.'

"If a buyer seems to hesitate, finally says that what he wants is a tonneau, while he is fighting over the price of a cab, be sure there is a woman in his business. Look out for her and when you have found the person, put your finest cab body on your worst chassis. That's a dead shot. And you get rid of a 'nightingale' you had in the garage for three years.

"Remember that the customer who talks much pays little.

"Remember that your best friend in the Automobile Industry is the Painter.

"Always make a client believe that he knows a lot in automobile mechanism. Tell him, for instance little things like these: 'You who are a connoisseur,' or 'As you know the business just as well as I do, I shall not insist upon the fact, etc.'

"Also vary the epithets, 'luxurious,' 'chic,' 'original,' 'distinguished.' They are words to be used when a man comes to you in company with his sweetheart. But you might say sometimes, 'comfortable,' when the customer is in the garage with his wife.

"Be gentle and patient in all circumstances. For instance if a blessed fool comes and asks you if that 10-horsepower can go 60 miles an hour, say, 'Well, the weather should be particularly favorable, you know,' or 'I hardly think so, with the body she has on.'

"Be cold with society people, spinner of phrases with the timid, severe with the undecided, jolly with the selfmade man, smiling with the 'ripe lady,' disdainful with the incredulous, indifferent with the skin-flint. Always keep a high and well-maintained glance, don't leave your adversary's eyes when you affirm something.

"Have always fine shoes. In the garages, the people that reflect have the mania of always looking at your feet.

"Insist on the 'economy in consumption.' The argument is irresistible above all with wealthy people. They spend willingly 10,000 francs to get 50 cents. This is special to Motoring."

HIGHWAYMEN ATTACK CAR IN JERSEY.

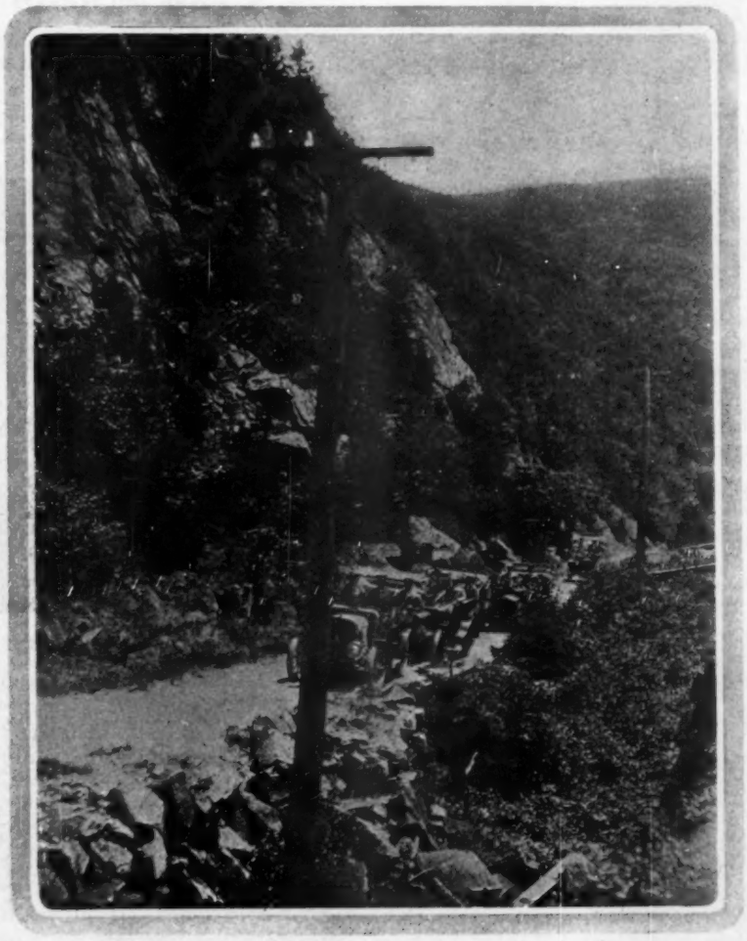
TRENTON, N. J., June 18.—An attempt by road agents to hold up the 48-horsepower Packard belonging to the Hon. Cornelius Turford, between Lawrenceville and Princeton, has provided a sensation in automobile circles here. The occupants of the machine, Barker Gummere, treasurer of the Trenton Trust Company, and Charles E. Gummere, solicitor of the Pennsylvania Railroad, had been to Princeton attending class day exercises at the university, and were returning home. When they reached a point about a mile above Lawrenceville, a man seated in a wagon alongside the road called out to them to slacken speed if they didn't want to be killed. About 100 yards further on a large man blocked the way and ordered them to stop, and the headlights showed a rope stretched across the highway, held by a man on either side. The chauffeur tried to avoid striking the man in the road, but the machine crashed against him with full force. The men at the rope dropped it and fled, and the party in the car proceeded on to Trenton. The police have been unable to obtain any clews up to date.

TOURING IN THE WHITE MOUNTAINS

By ROBERT BRUCE.

WITHIN the past two or three years the White Mountains of New Hampshire have become fairly well known to thousands of American automobilists. Many others who have not had the opportunity to personally explore this section, and of thus gaining first-hand knowledge of the excellent tours and first-class facilities to be found there, have at least had their imaginations stirred as they have read of the various successful trips already made from practically every direction. The pilgrimage to and from these Granite Hills really began early in 1904, and it has steadily grown up to this writing.

Some heavy grades are encountered, it is true, especially when coming into Crawford Notch from the south or east, and coming into Bethlehem from the south or west. Yet these grades are no steeper than numbers of climbs which are taken as a matter of course in Pennsylvania or Wisconsin, to say nothing of those in Colorada, Utah, Wyoming or California. Many of the roads along the valleys and around the bases of the mountains are nearly as level as those of the Western prairies.



IN THE HEART OF CRAWFORD NOTCH, WHITE MOUNTAINS.

It must be admitted that many touring cars have been hauled through Crawford Notch, up Bethlehem Hill, etc., as well as "assisted" at various other places. But in most cases this has been caused either by some minor injury, which has rendered the car incapable for the time being of giving its best service, or else made necessary by the slippery condition of mountain roads following the frequent heavy rains. The percentage of "assisted" cars will always be found to be very small as compared with the number of those that pass easily and almost unnoticed over even the worst grades in the most unfavorable weather.

A Notable Absence of Urban Annoyances.

There are many compensations—most valued of them all, of course, the entire absence of city conditions, with its dense crowds and heavy traffic. While within the last two years the New Hampshire legislature has passed its first laws regulating speed and prescribing other conditions, it is safe to say that there will never be a campaign of persecution, such as has so long been waged at certain places in New Jersey and by a few towns on Long Island. The revenue from tourist travel up there is too great to be lessened or endangered in any such way by the thrifty people in the small towns and in the country. Openly reckless tourists may be "picked up" now and then, but on the whole the welcome to the White Mountains will be friendly and lasting.

Fresh Water Supply Ever Prevalent.

Water is nearly everywhere as abundant as air. The stranger who tours in the mountain districts with a water-cooled motor car is surprised to note the number of springs, streams and roadside pools. He can scarcely travel a mile on any road without crossing some bridged and babbling brook, or finding a pure, cold spring bubbling up at the wayside. In the height of the season, of course, supplies will be found at nearly every hotel on the main-traveled routes. However, the few garages close when the great summer hotels do and other fashionable colonies go. Yet the merchants in the towns and villages, as well as most of the commercial hotels, have learned the advantage of catering to the transient autoist, and there will be no trouble in finding either a place to stay or the wherewith to supply one's machine with fuel as late as a mountain tour is in any way practicable.

A Supply of Spare Machine Parts Should Be Carried.

It is advisable, however, to take every possible care in planning a tour. One should prepare himself and equip his machine for a White Mountain trip exactly as he would for a tour in any other section of hilly country—looking particularly, of course, after the strength and certain action of the braking mechanism. Common sense driving will take care of the rest, even to getting along with the few frightened horses of the country districts. Everywhere the automobilist goes he will be kindly received by the hotel men and the townspeople alike, and it is probable that many will be the expressions of regret when the time comes to leave for home. The worst trouble likely to be experienced is the inadequacy of facilities for the proper repair of cars and the replacement of broken parts. The latter must usually be ordered from the larger cities, usually by telephone, the shipment being made in a night from Boston or New York to practically all New Hampshire points. Extra small parts should be carried in order to avoid delays.

Various Routes by Which Mountains Can Be Reached.

The steady increase of visitors to the mountains has brought forward many ways of reaching them from New York, Boston, Canada and other sections; but the pleasantest as well as the most novel way is, of course, by automobile. One desiring to make this trip from New York can do it in several ways. He may either tour to Boston by any one of the several routes, thence to the mountains by the Merrimack river valley or by the Coast Line to Portsmouth. Or he may go up the Hudson river to Poughkeepsie or Hudson, N. Y., and pass through Central Massachusetts to the Connecticut river valley. Or he may follow the road from New York to New Haven, Meriden, Hartford and Springfield, thence up the Connecticut river.

The distance from Boston by the route generally preferred by automobile tourists, viz., via Lynn, Salem, Newburyport, Mass., and Portsmouth, N. H., is only about 181 miles, and even if continued to include a few points or two not on the original program, the mileage will not exceed from 225 to 240. Such a trip ought to have at least two days, and if a first trip it would be wiser to extend it over three or four and see more on the way.

Dover is a short run of twelve miles inland from Portsmouth. From this point all roads lead direct into the mountains through Rochester, Ossipee and North Conway to Crawford Notch, Bretton Woods and Fabyan's; thence, in case the trip be prolonged, to Franconia Notch and the Profile House, with a considerable number of interesting towns and resorts between. The Maine Steamship Company's boats run direct from New York to Portland, from whence the White Mountains are about a hundred miles distant either via Sebago Lake or via Cornish, Me. This arrangement would require not more than one hundred miles of road traveling between New York City and the base of Mount Washington, while the car can be run on and off the boat much easier than it could be prepared for rail shipment.

Cost of Trip Largely a Matter of Taste.

Within reasonable limits, of course, the expense of a trip in the White Mountains are very nearly what one wishes to make them. If you are bent upon doing the thing "royally," an outside figure of $20 or $25 per day for each person can easily be spent. Or you can put up at first-class places and include reasonable incidentals for $6 or $7 per day each. Many do live on less than this and manage probably to have as good a time as do the rest. Fashionable people flock here in considerable numbers, especially in July and August, but as a rule those of real wealth carry things to less conspicuous extremes than the really semi-fashionable element, who, fearing to aim too low, often aim too high.

The hotel charges, whether "high" or "low" (both relative rather than exact terms) are only the basic items of expense with most people in the mountains. Carriage drives, horseback rides, guides and other accessories are what cost the most. Here is where the autoist, with even a fair knowledge of the roads, may find his car not only a means of independence but also a source of economical traveling.

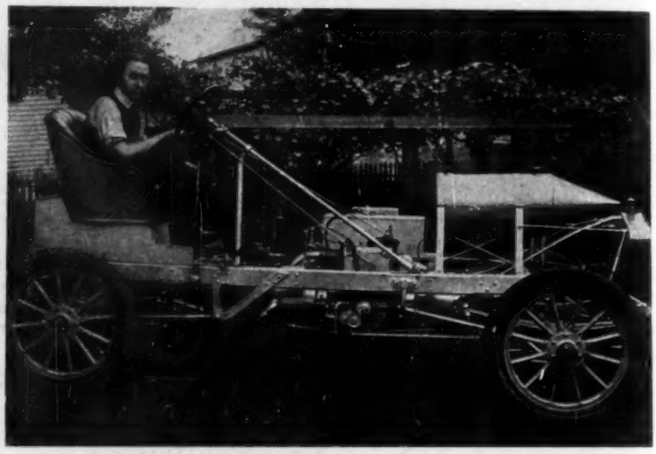
With such knowledge and such equipment, one needs neither public conveyances nor guides. Saving time, as compared with waiting for trains and making frequently inconvenient connections, he can usually plan an out-and-home trip in one day. This allows him, if desired, to make one place his headquarters during any length of stay he may choose to make; and yet the entire section is within easy reach.

At an expense representing perhaps nothing more than a few gallons of gasoline and a mid-day lunch for the party, he can make the slow and cut-and-dried one-day coaching tours, for which $10 fare is charged each person, seem like a seventeenth century junketing trip. The fare for the railroad trip up Mount Washington and return is $4, and the greater part of a day is required for it. In the same time a motor car could make the round between almost any two points in the central mountain district. If the future shall open the carriage road up Mount Washington to automobiles on equal terms with carriages, it will be entirely possible to take the road around from Bretton Woods, Fabyan's or Crawford House to Glen Cottage (on the opposite side of the mountain), make the ascent and return to the point of starting in time competition with the direct cog railway.

Taking all in all, the advantages and accommodations generally had in the White Mountains are so much superior to those of the average district equally distant from the big cities that no one who measures cost by quality of service need complain of the expense. There is nothing "cheap and shoddy" about the accommodations in this section, and the charges are invariably proportioned in just measure to the service rendered. That it is a region of all-around satisfaction for the auto tourist all who have toured that way seem to agree.

A NEW MICHIGAN RACING CAR.

A racing automobile of 60-70 horsepower has been completed by Dr. Freeberg, of Jackson, Mich., who has been an enthusiastic automobilist from the beginning of the sport, and who has ideas of his own as to how a fast car should be built. The car was built quietly, even secretly, in a private machine



DR. H. W. FREEBERG IN HIS 65-75-HORSEPOWER RACING CAR

shop in Jackson, the work having been done by one of the oldest machinists in the country under Dr. Freeberg's supervision. The machine will be known as *White Flyer No. 1.*

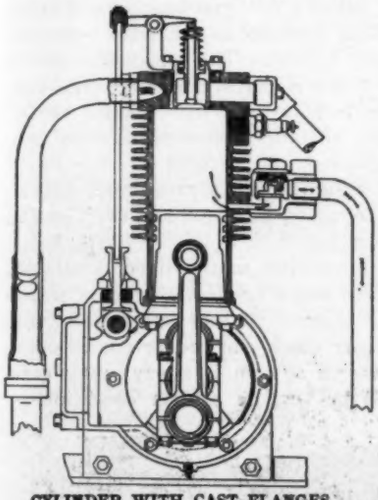
A horizontal water-cooled motor is used, having four opposed cylinders and carrying the flywheel at the middle of the crankshaft. Transmission is from a sprocket beside the flywheel by chain to a planetary gear on a countershaft just behind the engine, and from the gear to the rear axle by chain. A ratio of 1 2-3 to 1 is given by the sprockets fitted, and the road wheels are 30 inches in diameter. Countershaft and road wheels are geared "level" and revolve at the same angular speed. A second set of road wheels, 34 inches in diameter, can be used, giving a higher road speed for a given engine speed than the smaller wheels. The weight of the car is 1,850 pounds, and the load is equally distributed between the front and rear wheels. The general appearance of the machine is clearly shown by the accompanying halftone engraving.

The doctor expects to do a good deal of racing with his new car during the coming season, and will shortly give the car an official test run over a mile course.

Switzerland is considering the advisability of imposing practically prohibitive entry fees on automobiles of more than 12 horsepower in retaliation for the so-called international boycott instituted in December last. The boycott is very half-hearted.

AIR-COOLING SYSTEMS FOR MOTORS

AIR-COOLING, as applied to motors of sufficient power for use in automobiles, is a distinctly American development, and has been brought to a high state of efficiency in this country, though in other automobile building countries air-cooling has not been given serious attention for automobile work, except in a few isolated cases. The air-cooled motor originated in France, where it was early used for bicycles and tricycles—vehicles now classified under the general heading of motorcycles—and it was exceedingly popular. When it came to automobile motors, however, water cooling was adopted in most cases, even for the smallest cars, and invariably for larger machines. For motorcycles the air-cooled motor is still the standard, though occasionally water cooling is employed. In the United States, however, the air-cooled motor appealed strongly to manufacturers and the work of overcoming the difficulties of building large air-cooled motors has been carried out along various lines and with very satisfactory results. Cars are now built with 40-horsepower air-cooled motors with four vertical cylinders; this means 10 horsepower to a cylinder, which would have been considered an impossibility a few years ago.



CYLINDER WITH CAST FLANGES.

Note valves in head, auxiliary exhaust and large piping.

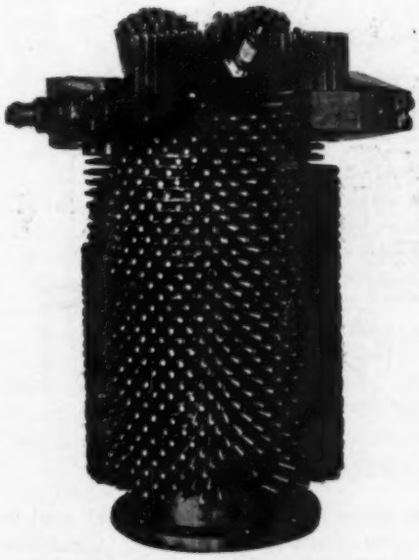
Radiation and Convection.

Before discussing the construction of the various types of air-cooled cylinders, it may be well to insert a word of explanation with regard to the terms radiation and convection. While radiation plays an important part in the cooling process, radiation alone would not prevent overheating. To radiate, according to the actual meaning of the word, is to "send out in straight lines." The heat from the cylinder goes out in straight lines and if there happens to be any heat conducting substance in the path of those lines, the radiated heat passes into it. The heat from the inner walls of the cylinder is radiated through the iron to the surfaces of the flanges on the outside, and thus far radiation is indispensable; but when it comes to removing the heat from the flanges, radiation is a very slow and inefficient process, and air an unwilling absorbent of heat. Radiation is entirely independent of air currents, for heat will radiate in its undeviating straight lines regardless of the strongest blast.

Radiation, then, being a comparatively feeble process, how are we to get rid of the heat that accumulates on the flanges and, if not removed, will overheat and stop the motor? By convection—conveying or carrying away. A draft of air is directed against the cylinder and the molecules of air, coming in direct contact with the hot surface, absorb heat and carry it away. It is like wiping water off a wet surface with a cloth, rather than letting it dry up by evaporation. The process of convection is entirely distinct from radiation though the two are commonly confused.

It will now be seen that the flanges and other area-increasing devices on air-cooled cylinders are used as surfaces on which the heat from within the cylinder can be spread out to be the more readily picked up by the passing air currents.

Methods of Increasing Cooling Surface.

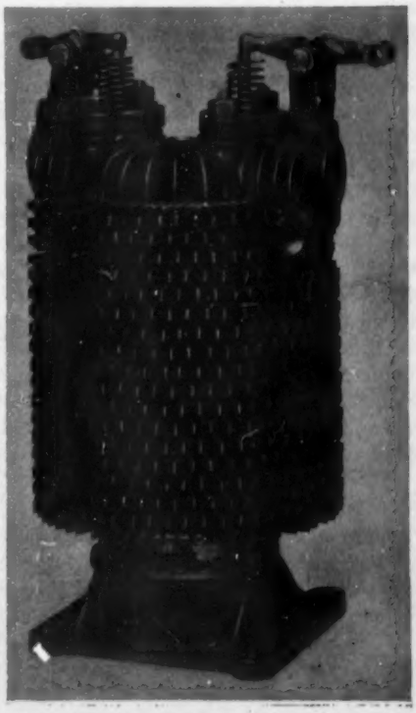


THREADED PIN COOLING SYSTEM.

The first successful air-cooled cylinders were made with a series of integral flanges, ribs or rings extending around the exterior of the cylinder and head, placed quite close together and made as thin as possible. This arrangement is still the most commonly used and is adopted by many successful manufacturers of air-cooled motors. The flanges are usually cast integral with the cylinder, and in some cases are machined but more commonly left as they come from the foundry except for a little smoothing up. Integral cooling flanges are not, however, used on all successful air-cooled automobile motors; there are many types of cylinders in which pins, pieces of corrugated metal, tubes, spirals and other devices are inserted.

In one type the cylinder is a plain casting, rather heavy; holes are drilled from the outside about 3-16 inch deep—care being taken not to break through the inner wall—and the holes are tapped. Into the tapped holes are screwed steel pins, each pin having a deep thread or groove cut along its entire length to increase the superficial area. The pins are set close together and give the cylinder a very characteristic porcupine-like appearance.

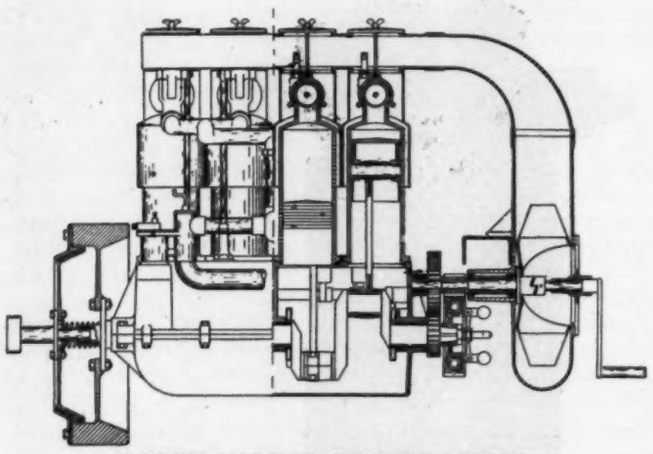
In another type tubes are screwed into the cylinder casting, slots being cut in the tube to permit free circulation of air. Another cylinder has a multitude of steel or



INSERTED METAL COMBS.

brass spirals screwed in, and looks as if spiral springs were projecting from it.

Copper flanges, plain and corrugated, have been brazed to both cast-iron and steel cylinders. It is rather difficult to use copper in this way because of its wide range of expansion and contraction under the influence of alternate heating and cooling. To be effective, the copper must be in actual contact with the cylinder—even the formation of a film of oxide between the adjoining surfaces reduces the transference of heat.



JACKETED CYLINDERS AND FORCED DRAFT.

In still another type grooves are cut in the outer wall of the cylinder and copper fins, usually having comb-like teeth, are inserted and the metal along the grooves is then hammered or "peined" down so as to forced against the inserts. A very secure job is thus made. A rather curious method of inserting copper fins consists of drilling holes lengthwise in the cylinder wall from top to bottom and then slotting the outer wall so as to open the holes. Strips of copper the length of the grooves are doubled lengthwise, the bend being made of the same cross section as the slotted holes in the cylinder. The strips are then forced into the grooves, being slid in endwise, and are retained only by their close fit in the grooves. A casing surrounds the cylinders, four in number, and a forced draft is maintained by a fan-blower.

A rather difficult piece of work consists of placing copper flanges or toothed pieces in the mold in which the cylinder is cast, the molten iron surrounding and gripping the bases of the copper pieces.

An extremely novel and interesting surface-increasing device has been made as follows: Copper wire of square section was wound over a form as if to make a long spiral spring, except that the form was triangular instead of round, the triangle having a short base and two long sides. Inside the spring-like coil thus made was run a flat copper ribbon, and the whole was wound around the cylinder, the copper ribbon pressing the short base of the triangular coil closely against the casting. Then the cylinder was placed in an electro-plating bath and the coils united to the casting by a heavy coating of copper.

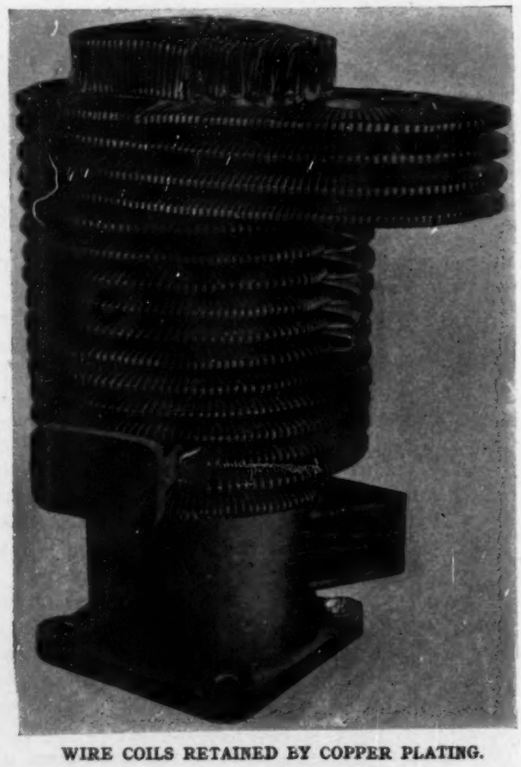
Other Methods of Air Cooling.

The practice of enclosing the cylinders in jackets and blowing air under slight pressure through the jackets, has met with success. When this is done the flanges and other projections on the cylinder are not so essential, and are present only in a rudimentary form, in some cases. The fan or blower used with such a motor is of course depended on wholly to produce the air current, and natural draft is not considered, nor can it be, owing to the cylinders being inclosed.

In all air-cooled engines the valves are arranged to give the greatest possible freedom to the movements of the gases, especially the exhaust. Valves usually open directly through the cylinder heads and are as large as the diameter of the head will permit. The importance of getting rid of the intensely hot exhaust gas as speedily as possible has led one maker to adopt an auxiliary exhaust port which is opened, or rather uncovered, by the piston as it moves over the lowest part of its stroke; a check valve placed in the passage prevents the taking in of dead gas on the suction stroke.

While small automobile engines developing about three horsepower per cylinder are frequently run without fans, depending upon natural draft for cooling, the majority of air-cooled motors, like their water-cooled brothers, nake use of fans, sometimes placed in front and blowing back on the cylinders, and sometimes on top, blowing down on the cylinder heads. It is interesting to note that with the fan-in-front arrangement the rear cylinder of a well-designed four-cylinder motor does not suffer from overheating any more than do the others—in fact, sometimes the front cylinder, nearest the fan, will be the hottest. The reason for this is that the greatest volume of air is thrown out near the ends of the fan blades and the least by the nearly dead central part. The heavy outer air currents converge as they pass back, passing the front cylinders and striking directly on the rear ones. With a well designed fan arrangement the air draft can be distributed so as to keep all the cylinders at about the same temperature.

The lubrication of an air-cooled motor is, of course, a very important matter—even more so than that of a water-cooled motor, because the absence of lubrication will cause damage and overheating more quickly in the air-cooled cylinder. Therefore the lubrication system is always very carefully arranged and should be kept in perfect condition by



WIRE COILS RETAINED BY COPPER PLATING.

the operator of the car. Usually a splash system is supplemented by a force feed oiler of some good make. Jump spark ignition is the rule, the necessity for keeping the combustion chamber free of projections that might hold heat sufficiently to cause pre-ignition doubtless putting make-and-break ignition out of the question.

CATECHISM OF THE GASOLINE AUTOMOBILE*—III

By FORREST R. JONES, M.E.

Q.—Describe a primary electric battery, such as is used for ignition on a gasoline automobile.

A.—The primary battery is a group of cells electrically connected together as with wires. The dry cell (or semi-dry cell) is almost invariably used. Each cell is composed of three elements; usually carbon, zinc and a liquid electrolyte.

In the ordinary form of dry cell sheet zinc is made into a cylindrical vessel closed at the bottom and open at the top. A solid stick of carbon is placed inside and the remainder of the space is filled with pulverized carbon (coke). This is moistened with the liquid, generally a solution of sal ammoniac. The top is closed with pitch to prevent leakage and evaporation. Each cell is placed in a cardboard box, which protects the zincs of adjacent cells from coming into contact with each other when connected together to form a battery. A binding post for holding the wire connections is attached to the zinc and another to the carbon. Carbon is the positive element and zinc the negative.

In any cell or battery

+ (plus sign) indicates the **positive** terminal (binding post and nut).

— (minus sign) indicates the **negative** terminal (binding post and nut).

Q.—What is **series** battery connection?

A.—One in which each carbon is electrically connected to the zinc of another cell, except the carbon of one end cell and the zinc of the other end cell. The two binding posts left free are the battery terminals.

Q.—What is a **multiple** or **parallel** battery connection?

A.—One in which all the carbons are electrically connected together and all the zincs connected in the same manner.

Q.—What is a volt?

A.—The unit of electromotive **force** (electrical pressure, potential). The volt is analogous to pounds per square inch of liquid or gas pressure.

Q.—What is an ampere?

A.—The unit of curernt volume; a certain rate of flow of electricity (electrical current). It corresponds to gallons per minute, etc., for the flow of a liquid.

Q.—How much is the voltage of a carbon-zinc dry cell?

A.—About 1 1-4 volts per cell when operating for ignition purposes. It is slightly higher than this in a good cell that is not in use. The voltage continues to drop with the use of the cell.

Q.—What is an electric storage cell (accumulate-cell, secondary cell)?

A.—One which requires electric energy to be supplied to it before it will act to deliver current. It consists of two elements immersed in a liquid. The more common form has perforated lead plates or grids whose openings are filled with compounds of lead. The plates are immersed in dilute sulphuric acid. When electric current is forced through the cell, it changes the chemical composition of the lead compounds which are thus charged so as to give out electric energy to an amount somewhat less than that received by the cell.

Q.—What is a *ground* connection?

A.—As used in automobile practice the term means any electrical connection between a wire or part of the electrical apparatus and the framing of the machine. A "ground" may be made either purposely or accidentally.

Q.—What is a short circuit in an electrical wiring system?

A.—It is an undesirable path for the electric current which allows it to flow without passing through all the apparatus which should be included in the circuit. A short circuit generally has less electrical resistance than the proper circuit, although this is not necessarily true.

Q.—What is an induction coil?

A.—An electrical apparatus which receives a low pressure (voltage) current from a battery or other source and transforms it into a current of enormously higher pressure (voltage) and correspondingly smaller volume (amperage).

Q.—What is the primary or low tension winding of the induction coil?

A.—It is an insulated copper wire of a comparatively large cross section which is wound on a spool around a bundle or sheaf of small, straight, commercially pure soft iron wire, called the core. The copper wire carries the low pressure current from the battery or other source.

Q.—What is the secondary or high tension winding of the induction coil?

A.—It is a very thin insulated copper wire of great length wound in many turns around outside of the primary coil on the same spool. It carries the induced current of high voltage which is used to produce an electric jump-spark in the combustion chamber of the gasoline engine.

Q.—What is the vibrator (trembler, interrupter) of an induction coil?

A.—It is a flat strip of thin spring metal held firmly at one end and with a piece of soft iron attached to the free end. When an electric current is sent through the induction coil the trembler is set into vibration and breaks and makes the electric current during its double vibration.

Q.—What is the condenser of an induction coil?

A.—A number of sheets of tin foil laid together with thin oiled or varnished paper or other non-electric substance between them. The ends of alternate sheets of the foil are connected together electrically. Two groups of interlying sheets are thus formed. As used in connection with the induction coil, it becomes charged with electricity, when the current is interrupted by the trembler, and when the latter again closes, the condenser quickly gives out the electrical energy just stored in it.

Q.—What is a timer for jump-spark ignition?

A.—The apparatus which closes the primary electric circuit (battery circuit) to produce a spark at the igniter (spark plug) at the proper instant for igniting a combustible charge in the engine. It ordinarily consists of an outer casing of insulating material (hard rubber or wood fiber) with a hollow cylindrical surface in which metallic points are set. A central rotating part (rotor) driven by the engine brings a metal arm or similar device into contact with the stationary metal in the casing, thus completing the electric circuit through the timer. While the form varies greatly in different designs, the function is always the same.

Q.—How often should the timer close the primary circuit for each cylinder of a four-stroke cycle engine?

A.—Once every two revolutions of the main shaft for each cylinder (every four strokes of each piston).

Q.—At what speed should a timer with a single rotating contact arm or point rotate in a four-stroke cycle engine?

A.—Half as fast as the main shaft (crankshaft). This is the same speed as that of the camshaft.

Q.—Where is the timer attached to the four-cycle engine?

A.—Very frequently to the camshaft (half speed shaft, half time shaft). A shaft or chain drive especially for the timer is also frequently used in order to bring it in an accessible position, or where dirt and grit are not apt to accumulate on it, as well as for other reasons.

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Q.—Should the timer always close the primary circuit when the piston is passing through the same position in its travel, whether the engine is rotating rapidly or slowly?

A.—No. The primary circuit should be closed earlier in the cycle when the engine is turning over rapidly than when it is running slowly.

Q.—Why should the timer be closed earlier at high rotative speed of the engine than at slow?

A.—For two reasons:

First.—There is an appreciable time between the instant at which the timer closes the primary circuit and the occurrence of the spark between the ignition points in the combustion chamber. This time interval is constant whatever the speed of the engine. It may be called the lag of the spark. In order, therefore, to have the spark occur at a given position of the piston the timer must close the primary circuit earlier in the cycle when the engine is running rapidly than when turning over slowly.

Second.—An appreciable time is also required for the inflammation of the charge in the combustion chamber, and the rapidity of inflammation after ignition by the jump spark varies with the intensity of compression in the charge. When the charge is small and the compression low, more time is required for inflammation than with a full charge and correspondingly high compression.

For these reasons the timer should close the primary circuit earlier in the cycle when the engine is running rapidly than when it is turning over slowly; and also when the charge is small (by throttling) as compared with the full charge allowed to enter by an open throttle.

Q.—What provision is made for adjusting the timer with regard to the instant of closing the circuit?

A.—The part ordinarily referred to as the stationary part (as distinguished from the rotor) can be rotated part of a revolution (sometimes as much as 90 degrees) around the axis of the rotor. This is done by the connecting parts (rods or wires) which lead to a spark control within reach of the driver.

Q.—How much will a rotation of 90 degrees of the stationary part of the timer change the time of closing the primary (coil) circuit in relation to the rotation of the crankshaft in a four-stroke cycle engine?

A.—One stroke of the piston. This corresponds to one-half revolution of the crankshaft in the ordinary type of engine.

Q.—What is a late spark (late ignition)?

A.—One that comes late in the cycle of the engine. The spark coming after the piston has gone some distance on the impulse stroke is a late spark. It may come much earlier than this, however, when the engine rotates rapidly, since the speed of the engine enters as a factor in determining what is a late spark.

Q.—What is an early spark (early ignition)?

A.—One that occurs earlier in the cycle than the late spark. When the engine is running at considerable speed an early spark comes before the completion of the compression stroke. The timer may be adjusted so that the primary circuit is closed when the piston has completed less than half its compression stroke, but under this condition a spark will not pass when the speed is very high until the compression stroke has been nearly completed.

Q.—What is meant by advancing the spark?

A.—Moving the timer so that the primary circuit is closed earlier. This is the general acceptance of the term, but, as may be seen from the foregoing, does not always mean that the spark always occurs earlier in the cycle.

Q.—Describe a jump spark igniter (spark plug), naming the materials and their electric properties.

A.—The ordinary type consists of three essential parts, which are an outer casing of metal or alloy, a tube of insulating material such as porcelain or mica which fits into the outer casing, and a central metal rod or wire which fits into the hole through the non-electric tube (insulator). A small wire is rigidly attached to either the casing or central wire and its end brought to within a short dstance from the other metal part. The space between the point of the wire and the other metal part is called the spark gap or air gap. It should be about 1-32 inch wide. The outer metal is generally threaded to screw into the cylinder casting of the engine. The spark gap in the combustion chamber when the spark plug is in place.

Q.—Does the air gap in the spark plug offer the same resistance to the flow of electric current in the open air as in the combustion chamber when the charge is compressed?

A.—No. The resistance to the jump spark is greater in the compressed mixture than in open air.

Q.—If the electrical pressure of the secondary coil is only high enough to force a spark across the gap of the spark plug at atmospheric pressure, will any spark be produced when the plug is in the combustion chamber and the charge compressed?

A.—No. It is necessary to have enough electromotive force to produce a spark about 1-4 inch long in the open air in order to be certain of securing one inside the combustion chamber at the proper time.

Q.—How is the automobile wired in the jump spark ignition system for a single-cylinder engine using a battery for the source of electrical energy?

A.—One terminal of the battery is connected by a wire to the frame of the automobile (a bare wire will answer). The other battery terminal is connected to one end of the primary winding of the induction coil. The other end of the primary winding is connected to the insulated stationary metal portion of the timer. The rotor of the timer is electrically connected to the frame of the machine either by its metallic contact with the shaft which carries it, or by a wire when the rotor is made of insulating material and does not connect electrically with its shaft.

The path of the electric current is then from the battery to the primary winding of the induction coil through which it passes; then to the timer and through it during the time contact is made between the timer contact points; then to the frame of the machine and through it to the wire which connects to the "grounded" terminal of the battery.

A switch for opening the circuit is placed somewhere in the primary circuit, sometimes by cutting into the wire between the battery and the induction coil. In other cases the switch is placed on the induction coil box, so that there is no break in the wiring at any place outside of the apparatus.

A wire leads out from the secondary or high tension winding of the induction coil to the spark plug. This completes the wiring.

The high tension current passes along the wire from the induction coil to the insulated central wire of the spark plug, jumps across the spark gap to the outer bushing, which connects to the metal of the engine. Then down to the timer through the engine metal and back to the induction coil through the wire between the timer and coil already mentioned, which wire also carries the battery current. In most cases one end of the primary and one end of the secondary wire are both connected to the binding post of the induction coil to which the wire leading to the timer is connected. When this is not the case, an additional wire must be used to connect the body of the engine to a binding post at the remaining end of the secondary winding.

An automobile parade will be a prominent feature of the annual horse show at Oak Park, a suburb of Chicago, early in September next. John Farson, president of the Chicago Automobile Club, is president of the organization that is promoting the horse show.

WHERE AN AIR-COOLED CAR IS BUILT

EVERY modern manufacturing plant worthy of the name is divided and subdivided into departments, each department being responsible for a certain class of work and nothing else. The old-fashioned idea of training each man or set of men to do any job in the shop has given way to the modern method of specializing. Each man is a specialist in his line, and he is kept everlastingly at the same class of work until he is far more skilled in it than the all-round man could hope to be, and is more valuable to his employers and to himself than he would be otherwise. The departments are independent of each other to a great extent, but nevertheless all work in harmony. The work turned out from one department must exactly fit into the place prepared for it by another department, for there is no such thing as fitting and trimming to get things to go together. Each part is made to a fixed, unvarying set of dimensions, and these are so closely adhered to that any part of any car will fit just as well in the coresponding place in any other car of the same model; this is what is known as the interchangeable system of manufacturing.

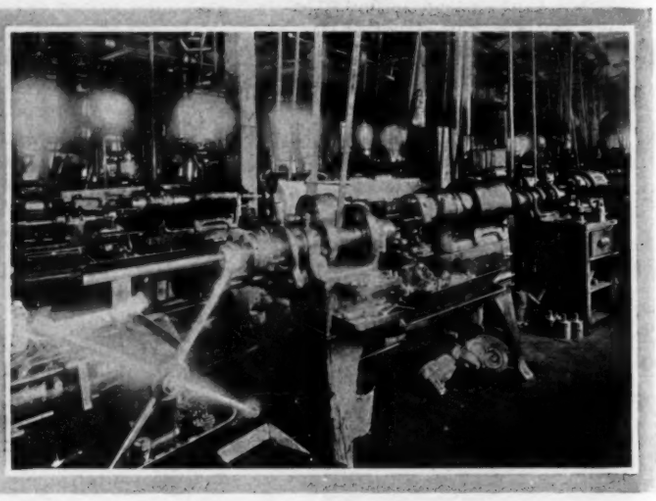
GRINDING A CRANKSHAFT

Automobile manufacturing establishments are notably up to date in specialization, production of interchangeable parts, the use of automatic machinery, and so on. The plant of the H. H. Franklin Manufacturing Company, of Syracuse, N. Y., is an excellent example of its kind, and a good idea of some of its departments may be gained from the accompanying engravings. It is interesting to note that the first Franklin cars, thirteen in number (evidently a lucky number in this case), were turned out during the season of 1901-1902 by a force of ten men. The first of these cars is still in active service in New York City, and could never be taken for anything but a Franklin. During the next three seasons the number of cars turned out increased rapidly; the second season 179 cars were built; the third, 659; the fourth, 1,102; while the company estimates the output for the season 1905-1906 at from 1,500 to 2,000 cars. The factory force has increased from ten men to 1,220 men and the floor space of the factory from 3,750 square feet to 150,000 square feet, and even this is now none too large, and further extensions, already provided for, are being considered.

Power for driving the scores of machines in the factory is provided by two Sterling water-tube boilers of 175 horsepower capacity each, supplying steam to a 200-horsepower straight-line engine direct connected to a Westinghouse generator of 160 kilowatts capacity, the current from which is used for power purposes in the factory as well as for the 1,200 arc and incandescent lamps, with the aid of which night is sometimes turned into day during the busy season. Additional power can be obtained at any time from the mains of the local electric light company. Fire protection is given a great deal of attention. In the power house is a Knowles pump having a capacity of a thousand gallons a minute. In the factory staircases are separated from the work-rooms,

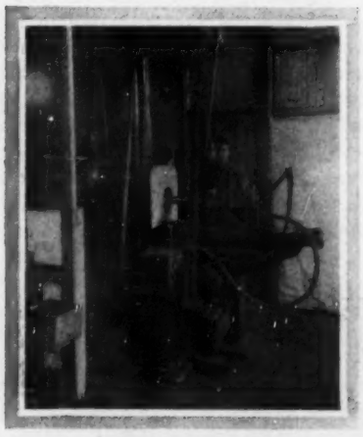
THE BIG MACHINE SHOP IN THE FACTORY OF THE H. H. FRANKLIN MFG. CO., SYRACUSE, N. Y.

THE PATTERN ROOM KEEPS A LARGE FORCE BUSY



AUTOMATIC MACHINE DEPARTMENT

and entrance is gained by means of large iron-sheathed sliding doors. Hand grenades and other fire-fighting apparatus is provided everywhere, and a private fire brigade, made up of men in the factory, is given several drills each week and kept in constant training for any emergency that may arise.



GRINDING A CYLINDER.

The engineering and experimental departments are important. In the Franklin factory these two departments occupy adjoining rooms; in the engineering and experimental departments new ideas are worked out and in the drafting room they are put on paper. These three divisions are under the direct supervision of John Wilkinson, whose work on the air-cooled automobile problem is well known. A competent corps of skilled men comprise his staff.

The raw material, as it comes into the works, is placed in the raw materials department in the basement, where more than fifteen hundred bins, racks and pigeon-holes contain all kinds of steel, brass, bronze and iron bars, tubing, wire, bolts, nuts, rivets and all the stock necessary to keep the factory supplied. Electrical supplies and tools are also kept in the basement and also sheet aluminum. Sheet aluminum is used in large quantities by the Franklin factory for car bodies, the company claiming to be the largest users of this material in the country. Machines for cutting up raw stock are also located in the basement, where they are close to the material on which they work. Other stock of a more perishable nature, such as curled hair and leather for upholstering, lap-robes, lamps, horns, carpet, rubber matting, hampers, and so on, are kept in the general stock room. In a special room, kept dark and cool, rubber tires are stored; it is stated that in the height of the season the average value of the stock in the tire room is about $25,000. All raw materials are thoroughly inspected before being worked up, a force of about twenty men having this work in charge. Metals are subjected to physical and chemical tests. Coils and other portions of the ignition apparatus are inspected by electrical experts; bearings are run under heavy weight and at high speed.

Next to the raw materials department is the sundries stock room. Here are stocked finished parts of all kinds, all carefully classified and ready to be shipped at a moment's notice to the orders of dealers or users of Franklin cars.

Above, in the machine shop, there is a continuous low roar from two hundred lathes, shapers, milling machines, grinders, screw machines, drill presses and the numerous other machines required to turn out an automobile. Some of the automatic machines can take raw stock from an eighth of an inch in diameter—the thickness of the lead of a blue pencil—to six inches in diameter. The rod or bar goes into one end of the machine and comes out in the form of dozens of com-

EAGLE-EYED INSPECTORS PASS JUDGMENT ON EVERY PART.

WHERE THE MOTORS ARE TESTED BY THE EXPERTS.

ASSEMBLING ROOM WHERE THE CARS ARE SET UP.

SCENE IN THE WOOD SHOP—MAKING THE BODIES.

pletely finished parts, all exactly alike, accurate to a hair's-breadth. Some of the automatic machine work is done with such extreme accuracy that gauges reading to one ten thousandth part of an inch are required to test the finished product. Specially constructed automatic recording micrometer measuring machines are used for the gauging in order to eliminate the possibility of human error.

Many of the special tools used in the factory are designed and built on the premises, a tool shop equipped with thirty-four machines and manned by a force of thirty-five men being devoted to tool making.

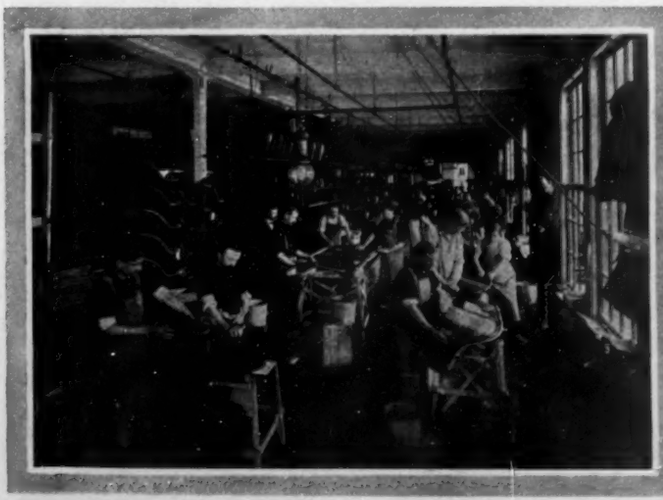
Every finished part of the Franklin car is closely inspected before being incorporated into a car. Fifteen men devote their energies to this work. The engineering department specifies exactly the limit of accuracy to which each part must be tested, and anything that varies in the slightest degree from the lines laid down must be rejected. The inspection process is carried along with the car as it takes shape, each part being tested for its working qualities when assembled. The transmission is a good example. Each of the gears and shafts has been separately tested and gauged, the gears have been tested for accuracy of contour and, in the beginning, the raw material was tested. But when the transmission is assembled it is given a final test to make sure that it works as it should, and that nothing has been neglected.

After the car has been completed, it is given a final inspection by men who do nothing else but go over finished machines and see that every nut and bolt and every single part, large and small, is in place and properly secured. The final test is the road test, after which the car goes to the shipping room, where sixteen men are kept busy weighing, crating, boxing and blocking automobiles in cars for shipment.

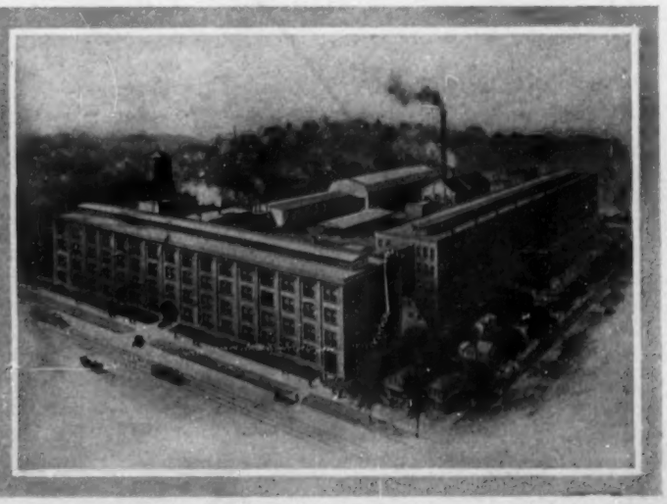
The commercial department occupies half the ground floor of one of the main buildings. In this department are the office and stenographic, production, cost, record, sales, foreign, purchasing, sundry, repair and bookkeeping departments; and there is even a legal department. A factory telephone exchange connects all departments by wire, and there is an inter-factory mail service that collects and distributes factory correspondence every half hour.

GAUGING THE CYLINDERS

The exterior of the Franklin factory is entirely in keeping with its character as a modern manufacturing establishment. Everything is neat and clean and, moreover, is attractive. Smooth lawns and flower beds, through which are cut graveled roadways and asphalt footpaths, add much to the appearance of the place, as do also the clean, bright windows and the general air of freshness. These may seem small matters, but in reality they are important.



SECTION OF PAINT SHOP, SHOWING TIERS OF BODIES.

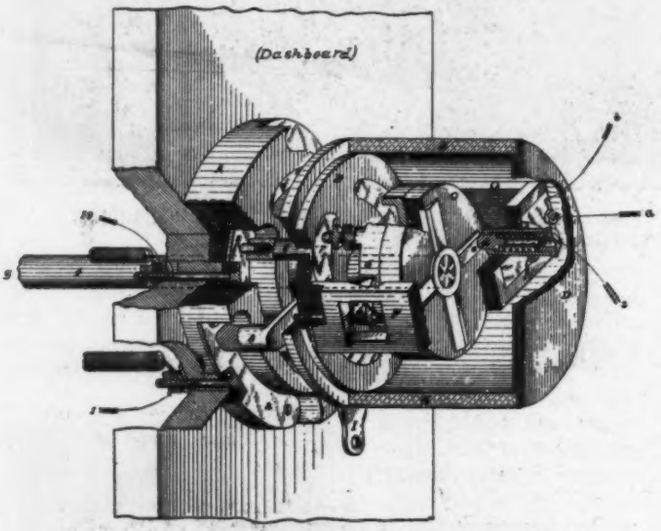


EXTERIOR VIEW OF THE FRANKLIN FACTORY.

NEW TIMER AND DISTRIBUTER.

A combined timer and secondary distributer, shown in the full-size engraving in this column and known as the Ellerslie distributer, manufactured by A. M. Lindsay, Jr., Minneapolis, Minn., embodies a number of meritorious features, one of which is that the wires connected to it are not required to move when the time of ignition is shifted. The visible sparking and the ease of cleaning are also good points.

Fiber plate *A* carries six brass segments (2) with bolts projecting back through the fiber. These are put through



CROSS SECTIONAL VIEW ELLERSLIE DISTRIBUTER.

holes in the dash, fastened by means of nuts, and all wires are fastened to these on the inside of dash, under hood at rear of engine, thus no wires pass through the dash and none move in any movement or action of distributer, and all are in plain sight and handy to get at. The shaft of the distributer proper is then inserted through center hole in fiber and through dash and proper connection made with engine. On the bottom or back of distributer are six tubes carrying in their ends steel balls under spring tension. These fit into curved slots in dashboard attachment, make contact with the brass segments, and at the same time allow of advancing the spark. All wires are connected and enter in this way, leaving the sides and top perfectly free to be removed for cleaning without touching another part, or in fact interfering with the working of machine. When the dash attachment is not used the wires are simply fastened by nuts to bolts which are used in place of tubes and ball contacts in bottom of distributer.

The distributer itself consists of a bottom piece of fiber *B*, carrying four brass distributing segments (7), and through which runs a shaft carrying on the end fiber plate *c*, which carries hardened steel star wheels and also brass ring 5 and distributer point 6.

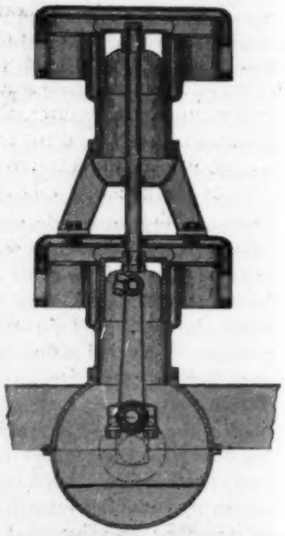
A bridge of fiber (F H G) carries secondary circuit on one side, which it delivers by pall 4 to ring 5. On the other side is the primary, which it delivers by bolt *a*, plate 6, adjustable tube *c* and plunger *d* (all hardened steel) to star wheel *e*. A glass tube is slipped over this and a fiber top with a thumb bolt fastening to bridge *H* forms a perfectly dust and rainproof casing, and yet one through which every working part can be seen at all times, and on removing this they are all exposed, and being perfectly flat are easily cleaned.

All primary parts are hardened steel and make absolute wipe contact, and are adjustable. The secondary parts are of brass, also adustable, so as to leave a slight gap, preventing all wear, intensifying the spark and at the same time allowing the operator to see every spark delivered to his plugs through the glass case. The easiest way to follow the two circuits on the drawings is to follow small letters from *a* to *g* for primary, and figures from 1 to 10 for secondary. No wires pass through the dash or are covered in any way beyond the regular insulation. No wires twist or bend in any way. All wires are as accessible as the plugs. All parts are in sight from seat at all times. No oil or grease to gather dust and short circuit; an oil cup lubricates main bearing, and filling primary contact tube keeps a film of oil on all contact points. By removing top and sides in one operation by a single thumb nut, all interior parts are exposed in flat surfaces and may easily be wiped clean without even stopping the engine.

All wiring is figured so closely that under all ordinary working conditions the machine will not short circuit. If, however, a wire breaks or becomes disconnected, they are close enough to short circuit, thus notifying the operator and precluding all chance of burning out the coil.

A STEEPLE GASOLINE MOTOR.

With a view to producing an automobile motor of such constant torque that change-speed gears will be unnecessary, William G. Simpson, a consulting and constructing automobile engineer of Detroit, Mich., has designed and patented a steeple gasoline motor. The illustration is a reproduction of the Patent Office drawing and shows one pair of the steepled cylinders. There will be eight four-cycle cylinders altogether, and each pair of cylinders will work through a single crank and will produce an explosion at every revolution. Thus the crankshaft will receive a power impulse every quarter of a revolution, giving the same turning effect as two double-acting steam cylinders.



SIMPSON MOTOR.

The piston rod of the top cylinder passes through a stuffing box in the head of the lower cylinder; the inventor states that this arrangement has been worked out satisfactorily. The engine which has been designed for a car has cylinders of 4½-inch bore and 4½-inch stroke and is intended to run at a normal speed of 1,000 revolutions a minute, at which speed it is calculated to develop 48 horsepower. The eight-cylinder steeple motor takes up exactly the same longitudinal space as a four-cylinder motor with cylinders of the same dimensions, but is, of course, of greater height; the height of the 48-horsepower engine in question is given as 29¼ inches from center of crankshaft to top of upper cylinder.

Mr. Simpson intends to place a steeple-engined car on the market for 1907, and states that the machine will have a gearless transmission for emergency use with air control; also air brakes and air clutch. Drive will be through gearing giving a ratio of 3 to 1. The wheelbase will be about 112 inches.

REO COMPANY'S TWO NEW BUILDINGS.

LANSING, MICH., June 18.—The Reo Motor Car Company has broken ground for two new buildings, each to be 500 feet long and 65 feet wide. Each will be two stories high. They will extend in the same direction as the other buildings and will lie directly south of them. They are expected to be finished by August 1.

"We need more room," said R. E. Olds. "This will provide floor space of 65,000 square feet in addition to the 240,000 square feet we already have, and will considerably increase our capacity."

BARRIAUX IN 15-H.P. VULPES, FIRST-PRIZE WINNER.

GRILLET IN 12-H.P. FOUILLARON, SECOND-PRIZE WINNER.

RESULTS OF TOUR DE FRANCE.

French annual competition for light cars and motorcycles—the Tour de France—has been concluded, and thoroughly demonstrated the practical utility of the low-priced motor car on European roads. The trial was organized jointly by the French Auto-Cycle Club and the Parisian daily *Les Sports*, and among the competitors were included 1,000-pound cars, tricars (touring and industrial), and motorcycles of a limited cylinder displacement (1-3 litre). A minimum speed of 30 kilometers an hour (22 miles) was imposed for all classes of vehicles, not on the ensemble of the tour, but on each stage.

The start was given by the officials of the Auto-Cycle Club at Port Mailot, the old starting point of the Paris-Bordeaux cycle race. Many of the machines entered since March did not start, owing to delay in completion, the result of the recent strike. However, more than 70 competitors in all classes took the road, and pursued the following itinerary: Paris, Orleans, Tours, Chatellerault, Poitiers, Angouleme, Bordeaux, Agen, Toulouse, Cette, Montpellier, Marseilles, Avignon, Grenoble, Lyon, Macon, Belfort, Nancy, Reims, to Paris.

The Winning Voiturette and Its Able Driver.

Barriaux, the excellent driver of the Vulpes Company, who entered a racing monster in the Grand Prix, won the trophy for the voiturette category. The Vulpes voiturette is a runabout of 15 horsepower, four separated cylinders, pump and high-tension magneto (Lacoste) actuated by same gear, long pressed-steel frame with long "fore hands," allowing the radiator to stand right over the axle; three speeds and reverse, multiple-disk clutch (Hele-Shaw patent) and shaft driven. The car can average a speed of 50 kilometers (31 miles), and weighs 1,200 pounds.

Winning Tricar and Its Unfortunate Competitor.

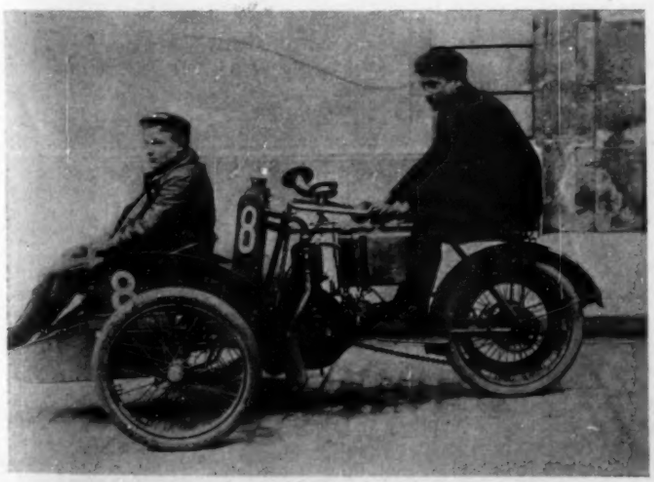
In the tricar class, the honors went to Schweitzer, driving the Austral machine, with 4 1-2-horsepower motor, water-cooled, fitted with an epicycloidal rear hub giving two speeds and reverse. Ignition by dry battery. The Austral tricar, as well as the others, carried one 140-pound passenger.

A type of tricar considered as one of the most perfect in France is the Contal Mototri. It is a compact and strong-looking machine, able to carry 500 pounds and the driver at a gait of 15 miles. The Contal people are the introducers of the Riviere hub, a geared disk which allows the operator to change speed with an ordinary clutch pedal. All the ignition, oiling and cooling parts (except the radiator) are protected by a metallic case placed at the rear of the carrier. The motor is one-cylinder, water-cooled, 5 horsepower. Several bad accidents prevented the Contal from classing itself honorably in the Tour de France.

A good tricar sells in France for 1,400 francs ($280). A great many are used in the retail trade by butchers, grocers, druggists, milliners, etc., and by the express deliveries.

Cissac Led the Motorcycle Brigade to the Finish.

Champion Cissac, who broke all road and track records for the past two years on the motorcycle, arrived first among the motorcyclists in Paris on his 2 3-4-horsepower Peugeot, having covered the last 120 kilometers in 2 hours and 11 minutes. His gasoline consumption averaged 5 liters (a trifle more than one gallon) per 100 kilometers (62 miles).

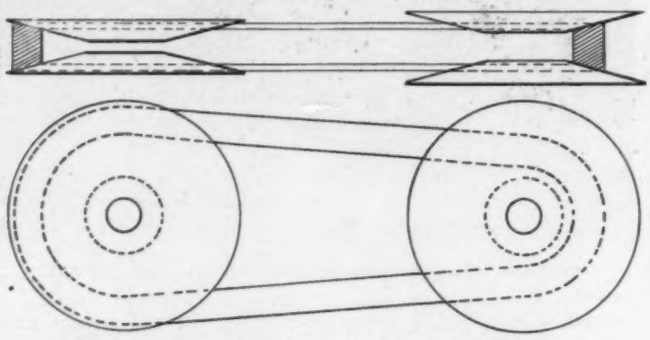


SCHWEITZER ON AUSTRAL, FIRST OF THE TRICARS.

CISSAC, FIRST OF THE MOTORCYCLISTS, WITH PEUGEOT.

EXTENSIBLE PULLEY CHANGE SPEED.

For a good many years "Old Friend Fouillaron," as they call him in Paris, in an ironical sort of way, had to fight bravely and endure the buffoonery of so-called experts and connoisseurs, who constantly shouted to the four winds that his invention was "no good." A. Fouillaron is the humble mechanic (to-day a prosperous motor car builder) who applied the extensible pulley as a



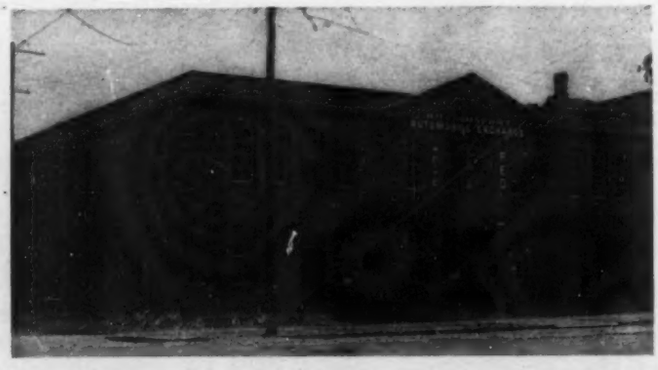
FOUILLARON'S EXTENSIBLE PULLEY CHANGE SPEED.

speed accelerator and slackener. The patent consists of two articulated pulleys, the first receiving its motion from the motor, the second transmitting its own to the driving shaft. The pulleys have two separate cheeks, each of which widen or grow narrow so as to form a large or small periphery for the adherence of a trapezoidal belt. A single lever—the speed lever—commands the widening or narrowing of both pulleys, and, as it may be plainly seen, the belt (of very much reduced length, as the pulleys are very close to each other) makes an up-and-down motion every time the driver maneuvers the speed lever, the tension of the belt remaining the same.

Fouillaron equips his voiturette with two and four-cylinder De Dion or Aster motors. The Fouillaron is considered as a very supple and swift little car. Eighteen speeds can be obtained, as the lever works on a sector bearing eighteen teeth. It is considered a very practical invention for traffic in crowded cities. The performance of the Fouillaron voiturette in the Tour de France was excellent.

WILLIAMSPORT'S SPACIOUS GARAGE.

What is claimed to be the finest automobile garage in northern Pennsylvania is shown in the photograph here reproduced. It cost some $14,000 to erect and is commodious and equipped with every modern convenience for the proper



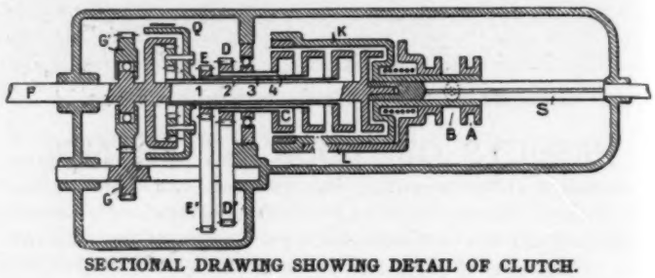
GARAGE OF THE WILLIAMSPORT (PA.) AUTOMOBILE EXCHANGE.

conduct of business and the comfort of patrons. It is owned by the Williamsport Automobile Exchange, which is a leading house in the trade in that city, being local representative for the White steamers, and the Reo and Premier gasoline automobiles.

A STUDY IN FRENCH RUNABOUTS.

Among the voiturettes (light runabouts) that are the success of 1906 in France, there is a very interesting little car built by Leon Demeester, whose name is attached to the history of the automobile. Demeester practically invented the motorcycle, of which he was the greatest champion in road and track competition for the last seven years. In 1904 he built a cheap runabout for his own use on entirely new principles and the car he has produced this year is considered in France as a model of perfection in its line.

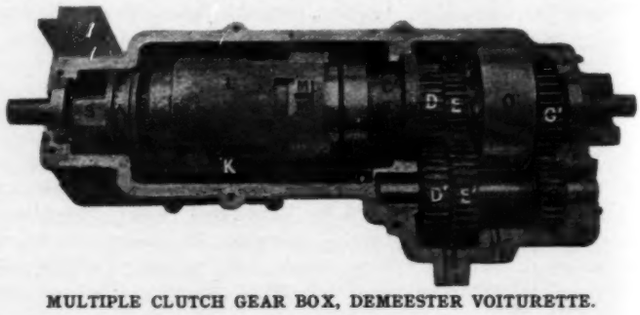
The chassis of the Demeester voiturette is of pressed steel, narrower in front so as to insure a better command on the front wheels; the "fore hand" springs are long enough to allow the radiator to stand right over the axle; on the rear,



SECTIONAL DRAWING SHOWING DETAIL OF CLUTCH.

they are also of a sufficient length, thus giving the body the best suspension possible. The joining of the cross pieces is obtained with strong brackets which give the chassis the desired rigidity. There are two models: the one-cylinder, 6 1-2-horsepower and the four-cylinder (68-76 millimeters). In the latter the motor is a bloc engine although the cylinders are separated between the top water jacket and the crankcase, made of aluminum. The gear box has three speeds and reverse. All the gears are always in mesh. The connecting rods placed inside the crankcase work in oil.

"To obtain the constant direct coupling in a gear box," says Demeester, "the wheels must be independent and free on one



MULTIPLE CLUTCH GEAR BOX, DEMEESTER VOITURETTE.

of the shafts, and to obtain a direct drive on the primary shaft, two different means are usually chosen—the claw-clutch or the friction. In both cases, those organs wear out sooner or later, and are liable to degenerate into sediment, and do some damage to other parts of the car. My gear box consists merely of four pulleys, on which can be applied a segmental brake forming a clutch. The segments, regulated by a reverse screw, revolve with the motor."

The Demeester voiturette is fast, reliable and perfectly noiseless. The four-cylinder type sells for about $500.

In France criminal methods have kept pace with the automobile movement. Recently three men were arrested in Paris after having bought a number of cars on the strength of forged letters, paid for them with notes that were worthless, and sold the cars before the notes matured. When the men were arrested their headquarters was searched and many incriminating papers found. The extent of their swindlings was about $20,000, and their operations extended over a period of about six months.

AUTOMOBILE CLUBS ACTIVELY AT WORK

New Jersey A. and M. C. Leases New Club House.

NEWARK, N. J., June 19.—Last week the New Jersey Automobile and Motor Club decided to rent the old Osborne mansion, 1034 Broad street, this city, for a term of five years. The house is one of the best-known landmarks in the city, and is located at the northeast corner of Broad and Chestnut streets. It is colonial in style, with seven tall columns supporting the portico, and is two stories in height. Very few changes will be made on the outside of the building, but the interior will be remodeled to suit the requirements of the club, which has appropriated $3,000 to cover the cost of the alterations. Work will be begun on these on July 1, and it is expected the house will be ready for occupancy by September 1.

The basement will be fitted up as a dining room, and the first floor with reception rooms, parlor and smoking room. On the second floor will be located the reading room, billiard room, etc. There is ample room in the rear yard for a moderate-size garage. Chestnut street, which runs alongside the house, is asphalted, as is Clinton avenue, which begins directly opposite. For three years the club has been waiting for a home of its own, and it will soon be housed luxuriously and comfortably.

Next Sunday, June 24, the club will hold a run to the old Imlay homestead, near Trenton, and enjoy a typical country dinner. W. I. Fisk, of the house committee, has the dinner in charge.

There is talk of a race meet at Waverly track July 4, under the auspices of the New Jersey Automobile and Motor Club, but the date is not definitely settled. B. M. Shanley and J. W. Mason compose the committee in charge, and plans will be formulated this week.

A mass meeting of all the New Jersey automobile clubs will be held in Newark, some time between June 20 and June 28, under the auspices of the Associated Automobile Clubs of New Jersey. Judge James B. Dill, of East Orange; George H. Spear, prosecutor for Hudson county; Motor Vehicle Commissioner J. B. R. Smith, of Trenton, and other prominent speakers will address the meeting on the workings of the new law which goes into effect July 1.

Under the new law 3,000 automobiles have been registered to date, against 17,000 last year. New registration agencies have been opened with Charles Crisman, Branchville; Frank Reigerman, Seabright; Augustus R. White, Freehold; Charles R. Zacharias, Asbury Park; F. L. C. Martin, Plainfield; William Evans, Bridgeton; S. S. Smith, Rahway; William H. Hinners, Edgewater; and John B. Brooks, Hackensack.

Six Hundred Orphans of Baltimore Given an Outing.

BALTIMORE, June 18.—The second annual orphans' outing and parade, conducted under the auspices of the Automobile Club of Maryland, was held June 14, with 75 cars in line. The starting point was the plaza in front of the clubrooms, and the route lay through the city to Electric Park, three or four miles out, where a special entertainment had been prepared for the children by the management. All the amusements at the resort were opened to the youngsters, and afterward ice cream and cake was served. It is estimated that 400 of the little tots took part in the outing. The committee in charge, consisting of Frank W. Darling, George S. Dickey, secretary of the club, and Lew S. Greensfelder, is now discussing plans for a similar trip for the inmates of the old people's homes and the hospitals for the incurable.

Cleveland Will Repeat Its Orphans' Day Run.

CLEVELAND, June 18.—Last year's Orphans' Day in Cleveland was such a successful affair that the Cleveland Automobile Club has decided to repeat it this year, and is arranging to hold the run some time during the month of July.

Still Looking for a Suitable Chicago Race Course.

CHICAGO, June 18.—After looking over the course in Lake county, near Libertyville, the members of the Racing Board of the Chicago Automobile Club have come to the conclusion that it will not be suitable for the road race which is to be given by the local organization in the fall. This course is a ten-mile circuit, but it was found that it was too narrow for two cars to pass each other in safety. Meanwhile the committee is searching for another course. The race will be for stock touring cars only, with full equipment.

Mr. Gregory and his committee are hard at work on the reliability tour which the Chicago Automobile Club is to give after the Glidden tour. The date has not been definitely set as yet, but it is known that the route will extend from Chicago to Milwaukee, from thence to Rockford, Ill., and back to Chicago.

It is possible that Chicago will have a hill-climbing contest in the near future. Several enthusiasts here point to Hubbard hill as the best place to hold it, and if the roads were suitably repaired it would make an ideal place for such a contest. At present the hill is in bad condition, the clay having a tendency to stick fast, but there is a great possibility of the road being repaved before long.

At a meeting of the directors of the Chicago Automobile Club it was decided to begin building operations at once on the new clubhouse, for which the site has been secured on Plymouth place, between Van Buren street and Jackson boulevard. Announcement was made by Secretary Sidney S. Gorham that ample money is now available to finance the construction of the building.

The success which attended the first annual Orphans' Day run of the Chicago Automobile Club on June 12 has prompted the directors to include it in the list of annual fixtures.

The annual tour of the Austin Automobile Club was held as per schedule June 9, and 70 cars were in the procession. The Chicago park system was visited, and the run finished at one of the North Side amusement gardens, where lunch was served. Mayor Dunne, of Chicago, was the guest of honor, and another prominent guest was President John Farson of the American Automobile Association.

Syracusans Are Arranging an Orphans' Day Run.

SYRACUSE, N. Y., June 18.—At the regular meeting of the club, held last week, it was decided to make arrangements for an orphans' run, at which time the inmates of the Onondaga Orphan Asylum will be given an outing. The children will be taken out the road to Jamesville, to romp on Fiddlers' Green, and fill themselves with sweetmeats, and will return by way of Orrville.

The club has appointed a special committee to look after the comfort and entertainment of the Glidden tourists when they arrive here July 13. Special cars will be chartered to take them to the White City, the Coney Island of Syracuse. About 400 tourists are expected. Four new members were elected at the club meeting.

Peorians Treat the Orphans to an Automobile Ride.

PEORIA, ILL., June 18.—Thirty-five orphans from the Home for the Friendless, in this city, spent the happiest day in their young lives on June 9, the Peoria Automobile Club, with twelve cars, taking them for a two-hour drive through the beautiful park system, fronting on the Illinois river, to Prospect Heights. At the observation tower a photograph was taken of the party.

Saturday, June 23, the club will hold its first annual race meet on the mile track here. The track is in fine condition, and it is expected Oldfield, who will be present, will do some record breaking in his Peerless *Green Dragon*. A card of amateur races has also been arranged.

New York Motor Club Adopts Plan to Supervise Contests.

NEW YORK, June 20.—At the last directors' meeting of the New York Motor Club, the action of the technical committee in giving an official supervision of a recent high-speed test, was approved, and a committee was appointed to draft a plan of procedure to be followed by the technical committee in the supervision of future manufacturers' contests, upon request. The action of the directors in thus preparing the way for systematic observation of such trials or contests it is believed will have a tendency to largely reform the situation with regard to promiscuous advertising of speed and hill-climbing trials throughout the trade.

A cablegram was sent by the club to Walter Wellman, who started from Paris on June 14 in his effort to find the North Pole by airship. Eight applicants for active membership and one nonresident member were admitted, and a committee was appointed to look up larger club quarters.

CLUB DOINGS IN GENERAL.

WORCESTER, MASS.—Orphans' Day will be observed this year by the Worcester Automobile Club, the governors having decided to make an effort to secure a larger turnout than last season's Orphans' Day. The arrangements are in the hands of Percival Whittall, chairman of the runs and tours committee. The date has not been decided on.

HOUSTON, TEX.—Good roads work is being commenced by the Houston Automobile Club in a practical manner. A county judge and a county commissioner were invited to accompany a club outing as guests of honor, and on the way the members pointed out road improvements that were needed. An active season of sporting and touring events has been planned.

NEW YORK.—Recent additions to the active membership list of the Automobile Club of America have swelled the total to 933, within 67 of the limit of 1,000 set by the club's rules. The club's associate membership list has reached a total of 217. Copies of the official report of the recent two-gallon efficiency test have been mailed to all members, also copies of the New Jersey automobile law which goes into effect July 1.

MINNEAPOLIS, MINN.—A speedway around Lake Harriet has been requested of the park board by the Minneapolis Automobile Club. The board has the matter under consideration. Secretary R. J. Smith of the club says that the organization is determined to have races during G. A. R. encampment week in Minneapolis, and unless a course is made by the city at Harriet, a week's program of races will be held at the Hamline track.

WILMINGTON, N. C.—The latest development in automobiling here is the organization of the Wilmington Automobile Club, with twelve members as a nucleus. It is planned by the club to erect a well-equipped garage at Wrightsville Beach, an adjacent pleasure resort, and as the club grows the country club feature will be added. The board of officers for the first year is as follows President, Dr. A. H. Harriss; vice-president, George B. Elliott; secretary and treasurer, Walter Sprunt; directors, the above officers and Frank Herbot.

ST. LOUIS.—The Automobile Club of St. Louis is making active preparations for carrying good roads work into the Legislature at the next session, and plans to arouse public interest in the advantages to be derived from good roads throughout the country. A strong delegation will go to Jefferson City and urge the lawmakers to do something to improve road conditions. Kansas City is following the example of St. Louis, and the Kansas City Automobile Club is arranging for a "Good Roads Dinner," at which the members will discuss ways and means for securing improved highways. Prominent members of the National Good Roads Association have been asked to address the members, and the members of the county court will also be invited.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Tours.

June 21-26—Second Annual Tour, Albany Automobile Club, Albany to Boston and return.
June 23...—Rochester, N. Y., Automobile Floral Parade at Genesee Valley Park, Rochester Automobile Club.
July 12-26—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.
Sept.....—500-Mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)

Race Meets and Hill Climbs.

June 23...—Peoria, Ill., Race Meet of the Peoria Automobile Club.
June 30...—Race Meet, Belmont Track, Philadelphia Automobile Association. Entries to R. M. Lacock, Turf Club, 1421 Walnut street, Philadelphia.
July 4....—Race Meet, Newark, N. J., Waverley Track, New Jersey Automobile and Motor Club.
July 3-4..—Chicago, Harlem Track, Race Meet.
Sept.....—200-Mile Road Race, for the Farson Cup, Chicago Automobile Club. (Date and course to be announced.)
Sept. 2....—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
Sept. 22...—American Elimination Trials for Vanderbilt Cup Race (Long Island Course probably.)
Oct. 6....—Vanderbilt Cup Race American Automobile Association.

Motorcycle Tours and Contests.

July 3-7..—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
July 4....—Tour to Rochester, N. Y., New York Motorcycle Club.
Sept. 3....—Race Meet, Muskegon (Mich.) Motorcycle Club.

FOREIGN.

Shows.

Sept. 1-8..—Canada International Exhibition. St. John. New Brunswick.
Oct. 5-14.—Leipzig (Germany) Exhibition, Krystall Palast.
Nov. 1....—New Zealand International Exhibition opens at Christchurch.
Nov. 1-16.—Berlin (Germany) Automobile Exhibition.
Nov. 15-24—London, Olympia Motor Show.
Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Tours.

July 26-Aug. 15—Circuit Européen, 3,000 miles, Paris, Milan, Vienna, Berlin, Cologne, Paris (postponement probable).

Races, Etc.

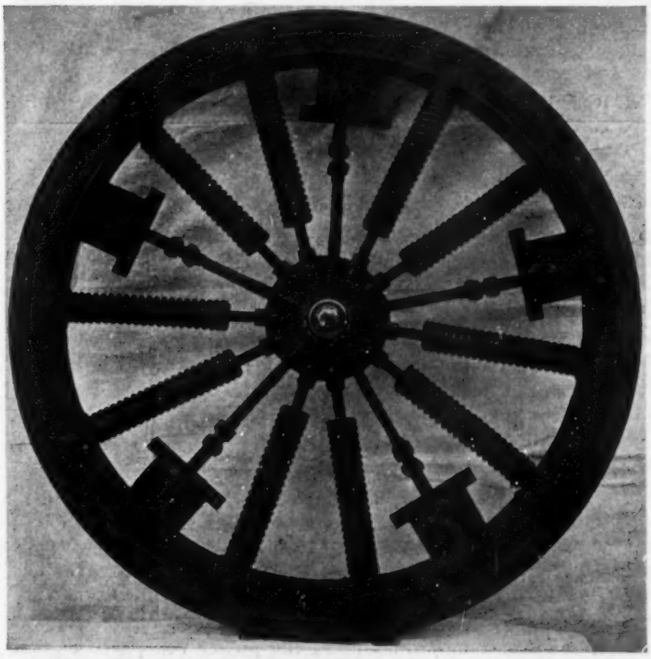
June 26-27—Le Grand Prix, Sarthe Circuit, France.
July 8...—International Cup Race for Motorcyclists, Cesky Club Motorcyclistu of Austria.
July 15...Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
Aug. 1-15—Circuit des Ardennes (Belgium).
Aug. 9-12—Malchamps (France) Hill Climb Tests.
Aug. 15-16—Ventoux (France) Automobile Meeting.
Aug. 14-19—Ostend (Belgium) Meet.
Aug. 18...—Liedekerke Cup Race.
Aug. 23...—Semmering Hill Climb.
Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
Sept. 3...—Auvergne Cup Race, France.
Sept. 27...—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
Oct. 7...—Chateau Thierry (France) Hill Climb.
Oct. 23...—Gaillon (France) Hill Climb.

Motor Boat Races.

June 28-29—Kiel (Germany) Motor Boat Races.
July 1....—Maison Lafitte (France) Motor Boat Races.
July 8....—Le Coupé Dubonnet (France) Motor Boat Races.
Aug. 6....—Motor Boat Race on the Rhone (France).
Aug. 9....—British International Cup Motor Boat Race.
Aug. 20-23—Ostende (Belgium) Motor Boat Races. Dover to Ostende.
Sept. 16...—Juvisy (France) Motor Boat Meeting.

A RESILIENT WHEEL FROM NEBRASKA.

The latest production in spring wheels is by James F. De Jarnette, of Omaha, Neb., who organized the Eby Manufacturing Company, with a capital stock of $100,000, to manufacture the same. By referring to the illustration it will be seen that there are five metal spokes projecting from a metal hub, not extending to the rim, but terminating in sockets attached to the rim, so that they are allowed considerable movement, but still have ample strength. Between the spokes are placed helical springs as shown in the cut, one end of each spring being secured to the hub and the other end to the rim. Thus, the wheel is virtually a suspension wheel, with spring spokes and auxiliary strengthening spokes. The lower springs are compressed and the upper springs extended by the weight of the car, the weight being transferred from one spring to another as the wheel rolls forward. The springs that are horizontal are also slightly compressed or extended, and add to the resiliency of the system. The springs do not, of course, have to transmit driving stresses, these being taken care of by the spokes.



DE JARNETTE SPRING WHEEL FOR AUTOMOBILES.

The manufacturers state that a set of these wheels has been tested on a Rambler car, for 1,000 miles, with excellent results. The wheels weigh considerably more than the pneumatic-tired variety, but this feature, the inventor states, can be remedied if necessary. James F. De Jarnette is president of the new company, H. E. Johnson, vice-president, and J. J. De Jarnette, secretary and treasurer.

AKRON'S FIRST AND LATEST AUTOMOBILE.

AKRON, O., June 18.—O. C. Barber, the Akron Diamond match king, has purchased his first automobile, a large touring car, said to be one of the finest in the state. It is the latest to arrive in Akron, and was a special object of interest to Achille Philion, who brought the first automobile to Akron in 1893.

"There is quite a difference between the first and last automobile in Akron," said Philion, as he surveyed the handsome Barber car; "I still have the first one. It is a steam machine with a small upright boiler and is a novelty now. Several automobile firms have offered me fancy prices for it, to show the evolution in the manufacture of automobiles, but I wouldn't part with it."

A FAMILY TOUR FROM DENVER TO THE EAST.

It is certainly an unusual thing for a man to take his wife and family of six children, the youngest of which is a baby less than a year old, and attempt to make a trip of several thousand miles in an automobile. This, however, is exactly

MAYOR BRADLEY AND HIS FAMILY IN HIS POPE-TOLEDO.

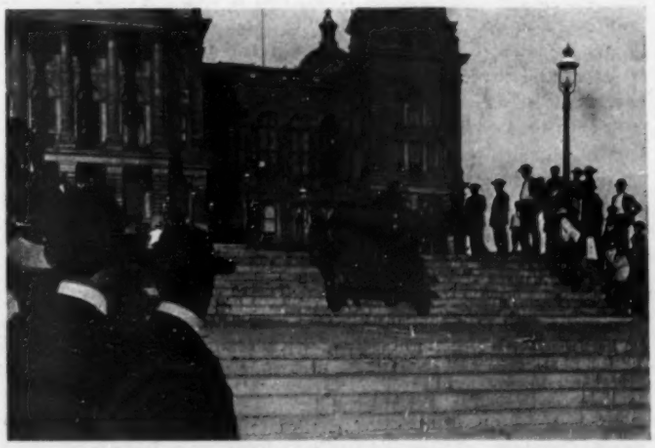
what C. A. Bradley, Mayor of the city of Lo.ngmont, Col., is starting out to do this week in his 30-horsepower Pope-Toledo. Mr. Bradley has made arrangements to make the trip by easy stages, and will make a tour of the Eastern states before returning home. The illustration shows how the family looks when seated in the car. Mayor Bradley certainly is not an advocate of race suicide.

HORSES BECOMING RARE, WILL PURSUE AUTOS.

INDIANAPOLIS, IND., June 18.—Automobiles having lessened the use of horses, and hence having eliminated to a certain degree the theft of horses, the Indiana Horse Thief Detective Association has announced that it will turn its attention to alleged violations of the Indiana automobile laws.

SOME STRENUOUS STEP-CLIMBING IN IOWA.

To show the capability of the 22-horsepower Mason car, which is manufactured by the Mason Motor Car Company, Des Moines, Ia., a test was recently made by the superintendent of the factory, F. S. Dusenberg, who drove the car up the State Capitol steps in that city As will be seen by the illus-



MASON CAR CLIMBING CAPITOL STEPS, DES MOINES, IA.

tration, the photograph of which was taken while the car was making the climb, it was no easy task. There was a total of forty-seven steps to be mounted, but the Mason did the trick. The motor of the Mason car is a two-cylinder opposed, with five-inch bore and five-inch stroke.

THE AUTOMOBILE

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Urgent Need of a National Registration Law. With the increase of automobiling in the United States the necessity for a national law governing the licensing of cars grows more apparent, and a national law regulating speed might not be too radical a measure for the broad minded to consider. A prominent automobilist has figured it out that it requires nine different licenses to make a trip of 600 miles from Boston to Baltimore, going by way of Providence and passing through the large cities on the route, a feature which in itself is ridiculous in the extreme and cries loudly for a remedy. Automobiledom is suffering to-day from over-legislation on the license question and it is none too early to begin the agitation for sensible national measures.

✷

Storage Battery Experiments and Facts. While a storage system of lighter weight for use in electric vehicles would undoubtedly be welcomed by both the manufacturer and purchaser, there is little likelihood of a radical change in the near future in battery construction, due to the recently reported discoveries of large quantities of cobalt in the western section of North Carolina. These cobalt beds have been known to exist for a number of years, and as the application of that mineral for use in storage battery construction is yet in an early experimental stage, a considerable period of time must elapse before the perfected product could be put on the market should the experiments prove successful. Intending buyers of electric vehicles are safe in purchasing the standard products.

The Growth of Automobile Route Information. We presume there are a few copies in existence of the Official Automobile Blue Books for 1901 and 1903, the result of the first attempts to map out routes especially for auto touring in this country. If those who still have the 1901 edition will place it alongside "The Automobile Official A. A. A. Blue Book," recently issued, the growth of five years will be shown in a very striking manner. The outside cover of the original volume reached exactly to the top of the gold-leaf imprint on the latest volume.

A still greater contrast is shown by the inside pages on which the routes are listed, the dimensions being 5¾ inches by 3¾ inches in the 1901 edition, as against 8½ x 4½ in the 1906 edition. Expressed in type area, there are only 21.56 square inches on the smaller page to 38.25 square inches on the larger page.

There are exactly 68 net pages of route matter in the original Blue Book, with more than half of these pages partly blank. Nearly as much type is used for the Boston section alone of the new volume as the aggregate of route matter in the earlier volume; add any other one of the New England sections to Boston and the two will greatly exceed the total type area of routes in published form five years ago.

The present Blue Book contains 54 sections in all, which, as a piece of publishing, would make about twenty of its prototype. Is there anywhere else a growth in automobiling more striking than this?

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A. C. A. Commercial Vehicle Trials. The announcement that the Automobile Club of America will hold trials of commercial vehicles this summer will be received with satisfaction by those who are interested in this special branch of automobile construction. It is now two years since a public test of these vehicles was held in America, and in the intervening time there has been very considerable improvement in design and construction. This has naturally followed the greater experience had with the use of such vehicles and the constantly increasing number of constructors interested in the problem.

It is no longer necessary to hold a test simply to demonstrate that a load varying from 500 to 10,000 pounds can be carried at a considerable rate of speed over city streets. The industry has progressed beyond this stage. But it is very desirable to bring to the attention of the public the progress which has been made in adapting the power vehicle to a great variety of special services. It is to be hoped, therefore, that the trials will have the hearty support of the builders and that as great a diversity of types as possible will be entered. Vehicles of the passenger type, especially, are of great commercial importance. It is the feature of publicity that is really the chief value of a commercial vehicle contest that can be carried out by any organization such as the A. C. A. The very diversity of types, while publicly illustrating the universality of the machine, makes analysis on a competitive basis difficult, if not impossible. And to get results that would satisfy all the reasonable inquiries of the user is more difficult yet. For example, a test conducted in summer would not be conclusive as to the practicability of the service by the same vehicles in the depth of winter. The question of economy, too, which now is so frequently asked, cannot be answered by any tests of brief duration, but must be worked on a practical and scientific basis covering an extended period of time.

It is in these directions that the trials of commercial vehicles fall short of what can be accomplished by tests of pleasure vehicles, along similar lines, which latter afford an excellent measure of value—positive and comparative. Those who await the results of the forthcoming trials should bear these limitations in mind and not expect the promoters to do the impossible.

ITALY'S VANDERBILT TEAM.

Cable advices announce that the Automobile Club of Italy has nominated the Italian team for the Vanderbilt cup race, and that the formal entries, together with draft for the entrance fees, were mailed on June 9. The entries represent three Fiat and two Itala cars, and the team will be made up of Lancia, Nazzaro, and Dr. Weilschott, who will drive the Fiat racers, and Cagno and Fabry, who will pilot the Itala machines. The Fiat contingent of drivers will sail for America immediately after the running of the Brescia Cup in Italy, September 10. The above information comes upon the authority of E. R. Hollander, of the Automobile Club of America, who was appointed during his recent visit to Italy as the provisional delegate to represent the Italian governing body on the Vanderbilt Cup Commission, and is authoritative.

Other cable advices received announce that there will be at least one British car in the race, an English Daimler, which will be driven by either Guy Vaughan or H. N. Harding. E. S. Partridge, of the Automobile Club of America, who is identified with the Daimler interests in this country, sailed last week for England to confer with the makers regarding the racer. If a special racing machine cannot be built in time, a 1907 stock car will be used with such changes as are necessary to bring out its full quota of speed.

Locomobile Company Will Enter a Car.

From the factory of the Locomobile Company, at Bridgeport, Conn., comes the announcement that there will be a Locomobile racer for the Vanderbilt cup. The machine is a duplicate of last year's racing car, with a four-cylinder motor that will develop about 100 horsepower. Joseph Tracy, who last year drove the Locomobile in the Vanderbilt race, securing third place, will drive the car in the great American classic on Long Island next fall.

Shepard May Drive the Hotchkiss.

Elliott F. Shepard will be one of the two amateur drivers in the Vanderbilt cup race, provided the Hotchkiss cars get a place among the leading five machines in the coming Grand Prix race in France. Mr. Shepard is entered to drive one of the three 120-horsepower Hotchkiss cars in the French race, and should he finish inside of fifth position will undoubtedly pilot the Hotchkiss in the Vanderbilt race.

Matheson Car Formally Entered Some Time Ago.

In last week's issue of THE AUTOMOBILE it was stated that the Matheson was among the probable entries for the Vanderbilt race. This is incorrect, as the Matheson Company made formal entry and paid their entrance fee some time ago. Their car is well on the way toward completion, and it is possible that these makers will be able to enter another one. The Matheson racer will be the regular stock model for 1907, and after the race will be used for demonstrating purposes.

ECONOMY TEST POSTPONED TILL AUGUST.

At a meeting held Saturday, June 15, the Contest and Technical Committee of the New York Motor Club decided to postpone the Economy Test scheduled to take place June 20-22 until Wednesday, Thursday and Friday, August 29, 30 and 31. The action taken was in deference to the wishes of a number of manufacturers, who stated that though they desired to enter cars for the June contest, it was practically impossible to do so owing to the heavy pressure of business at this time of the year.

All those who have entered have signified their intention of allowing their entries to remain for the postponed date. All the officials of the tour have agreed to act in August, and arrangements will be exactly the same as if the tour had been held this week, as originally projected.

B. F. GOODRICH CO. WITHDRAWS.

Notice was given by the B. F. Goodrich Company, of Akron, O., at the meeting of the Automobile Tire Association, held in New York, June 15, that it would withdraw from the association in September, at which time the agreement at present existing between the tire manufacturers will expire.

Reasons Given for Goodrich Quitting the Pool.

AKRON, O., June 18.—Foreign tires and price cutting by other manufacturers are given by the B. F. Goodrich Company, of this city, as the chief causes for the withdrawal of that company from the Automobile Tire Association, as per notice served at the meeting in New York last Friday. By the action of the Goodrich company this association, it is said by members, will be dissolved entirely on September 1, when the notice of the Goodrich company goes into effect. The association is the largest and strongest organization of tire makers in the country, and included besides the Goodrich people the Diamond Rubber Company and the Goodyear Tire and Rubber Company, of Akron. Five other large tire manufacturers are in the association, which was formed among the lessees and owners of the G & J tire patents. The G & J Tire Company, of Indianapolis, is one of the members, and the organization was for mutual protection.

An official of the Goodrich company to-day stated that 10 per cent. of the tires used in this country the past year were imported, and this and the cutting of prices by manufacturers outside of the pool led the Goodrich company to decide that it would be better to withdraw from the agreement. The expense of replacing tires was another element that entered into the action dissolving the agreement. It is believed that this will have the effect of decreasing the cost of pneumatic tires to consumers.

Officials of the Goodrich company deny that the action of the government against manufacturers, combines and trusts has anything to do with the decision to abandon the tire association.

EDITOR BATCHELDER SAILS FOR FRANCE.

Managing editor A. G. Batchelder of THE AUTOMOBILE sailed via steamship *La Touraine*, June 14, for France, where he will witness the Grand Prix of the Automobile Club of France, June 26-27, and in his capacity as a member of the Vanderbilt Cup Commission and member of the racing board of the American Automobile Association, confer with Chairman J. de Mont Thompson on the matter of foreign entries for the Vanderbilt cup. Mr. Thompson sailed two weeks ago. A wireless message received from Mr. Batchelder on Saturday evening stated the voyage was perfect to that time.

NEW YORK DEALERS' MASS MEETING.

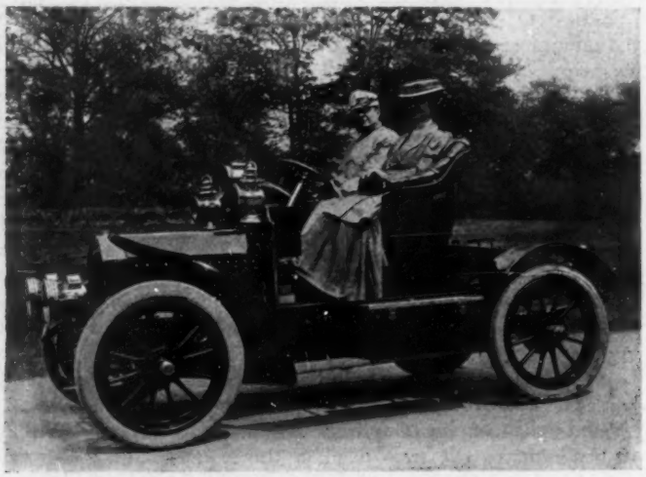
A dealers' mass meeting has been called by the board of governors of the New York Automobile Trade Association, to be held at the Empire Hotel, that city, Thursday, June 21, to discuss the advisability of making a demand on the manufacturers for an increase in the present discount allowance. The meeting is open only to dealers belonging to the association.

NEW BRIDGE OPEN AT AMBOY, N. J.

Automobilists in the vicinity of New York will be glad to learn that the new bridge between Perth Amboy and South Amboy, N. J., has at last been opened to the public, Tuesday of this week being the official day set for the opening. The bridge shortens the customary touring route by a number of miles from New York to Long Branch and other points in New Jersey along the shore.

AN AMERICAN ACTOR'S SUMMER TRIP.

Theatrical folks seem to take naturally to the automobile and enjoy the pleasures of its locomotion to the full. The engraving shows Walter Hale, a well-known actor and leading man in John Drew's company, and Mrs. Hale in their 20-horsepower Cleveland runabout, with which they will tour from Gibraltar to the North Cape, collecting materials



MR. AND MRS. WALTER HALE IN 20-H.P. CLEVELAND.

for a new automobile novel and for magazine articles. The car has been specially equipped for touring, but the travelers will go light, sending their baggage from point to point by rail.

WASHINGTON DEALERS' AUTOMOBILE MEET.

WASHINGTON, D. C., June 18.—The newly formed Washington Racing Association, composed exclusively of dealers and salesmen, held its first race meet at the Bennings track, June 16. There was a fair turnout of enthusiasts, and the sport proved very interesting. The program was made up of events for stock cars with regular equipment.

The best race of the day was a free-for-all at five miles, which was run in two heats and a final, and was won by M. Bird in a Packard, in 7:10 4-5. The three-mile event for gasoline cars was won by L. Jullien in a Reo, in 5:28 4-5, and an event of similar distance for runabouts was won by J. Fister in a Buick, in 5:20. R. Morgan, with a Stanley, won the race for steam cars, and the three-mile race for members of the Automobile Club of Washington was captured by S. L. Harris, in a Reo, in 4:57 2-5.

RACE PROMOTING ASSOCIATION FORMED.

CHICAGO, June 18.—The Western Automobile Racing Association filed articles of incorporation at Springfield, Friday, June 15, asking for a charter. The new association is capitalized for $2,000 and William Pickens, a promoter of meets for the past two or three years, and also manager of Barney Oldfield, is president. The promoters intend to hold meets in various of the larger cities of the United States and Canada during the present summer and fall. Chicago will get the first of the meets, as a two-day tournament will be held at the Harlem racetrack July 3 and 4. Prizes aggregating $3,500 will be offered, and an additional $2,000 in gold for the open professional race.

DUGALD CLERK WILL VISIT AMERICA.

Early in July, Dugald Clerk, of London, who is said to be the greatest living authority on gas motors, will sail for this country. It will be Mr. Clerk's first visit to the United States. In the early stages of the Selden patent litigation he was retained by the plaintiffs, and while here will give testimony before the United States Commissioner in the suit now pending.

AUTO RELAY FROM CHICAGO TO NEW YORK

Monday morning, June 18, at 8 o'clock, the automobile relay trip from Chicago to New York of the Hearst daily papers was begun. The courier, who was transferred from auto to auto during the 1,024 miles, carries a dispatch from Brig.-Gen. William H. Carter, commanding the Department of the Lakes, to Brig.-Gen. Frederick D. Grant, of the Department of the East, stationed on Governor's Island. Such noted drivers as Jerry Ellis, Webb Jay, H. W. Lyttle, Percy Owen, and Gaston Plaintiff participate in the journey, the schedule for which is being carried out at time of going to press.

Relays.	Miles.	Total Miles.	to	Time Due.
1st	55	55	Valparaiso, Monday	10:30 A. M.
2d	53	108	South Bend	12:20 P. M.
3d	62	170	Kendallville	3:30 P. M.
4th	41	211	Bryan	5:30 P. M.
5th	66	277	Toledo	9:00 P. M.
6th	66	343	Norwalk, Tuesday	12:00 A. M.
7th	55	398	Cleveland	2:30 A. M.
8th	55	453	Ashtabula	5:00 A. M.
9th	41	494	Erie	7:00 A. M.
10th	30	524	Westfield	8:30 A. M.
11th	33	557	Jamestown	10:00 A. M.
12th	33	580	Salamanca	11:30 A. M.
13th	56	636	Wellsville	2:30 P. M.
14th	28	664	Hornellsville	4:00 P. M.
15th	41	705	Corning	6:00 P. M.
16th	35	740	Waverly	7:45 P. M.
17th	43	783	Binghamton	10:00 P. M.
18th	34	817	Unadilla	11:30 P. M.
19th	38	855	Delhi, Wednesday	1:30 A. M.
20th	68	923	Kingston	5:00 A. M.
21st	41	964	Newburg	7:00 A. M.
22d	60	1,024	New York	10:00 A. M.

EXPERIENCED HORSEMEN AS CHAUFFEURS.

One of the noteworthy features of the season is the interest taken by wealthy owners of automobiles in the education of their employees in the art of managing and driving their cars. There is a tendency on the part of employers to provide automobile tuition for the men who have been driving their horses for a number of years, which indicates that not only must the side of mechanical proficiency be considered a factor in the education of a chauffeur, but experience as a driver of horses and in the management of carriages in crowded streets is a matter of great value in the handling of an automobile. The New York School of Automobile Engineers, located on West Fifty-sixth street, has among its students a very large percentage of experienced coachmen employed by wealthy families. The class of instruction given is of the very best, and the results shown are bound to have a good effect on public opinion in the future. The management of the school reports that the horsemen have made particularly apt scholars, in road work, especially. As soon as they have mastered the changes of gears, application of brakes, starting and stopping, etc., they become proficient in the management of the car very quickly. Their past training is very useful, as it makes them quick to observe, and as they possess a knowledge of the rules of the road, they become particularly valuable as careful drivers in these days of rather reckless driving.

AERIAL NAVIGATION AT THE CAPITAL.

WASHINGTON, D. C., June 18.—Aeronaut Lincoln E. Beachey gave a notable demonstration of the possibilities of aerial navigation with motor power in this city on the morning of June 14, in Knabenshue's airship No. 2, in which he left Luna Park, four miles south of Washington, and anchored in the Washington Monument grounds. After crossing the Potomac river, the spectators saw Beachey step toward the front of the airship and by his weight bring the machine toward the earth. He was then probably 600 feet above the ground. When at the desired height he made a shoot for the Washington Monument, and as he neared it he again stepped toward the front of the machine, and the airship glided gracefully toward the earth. While the airship was hovering over the Potomac river, just to show the public how perfect his control over the machine was, he cut several figure 8's in the atmosphere and dipped and raised the airship at will by sliding forward and backward on the three rails beneath the gas bag.

P. L. HUSSEY ORGANIZES NEW COMPANY.

A new company has been formed to carry on the manufacture of drop forgings for automobiles, succeeding the Hussey Drop Forge and Manufacturing Company, of Cleveland, O., to be called the Cambria Forge Company, located at Johnstown, Pa., and capitalized at $150,000, with $125,000 paid in. The officers of the new company are: W. Milt Brown, president; R. P. Smith, vice-president; C. G. Campbell, secretary-treasurer; P. L. Hussey, general manager. The board of directors includes John Waters, president of Johnstown Radiator Company; J. W. Walters, president of Johnstown Lumber Company; W. Milt Brown, electrical engineer of Lorain Steel Company; C. G. Campbell, treasurer of Johnstown Lighting & Heating Company; John McClean, Pittsburg Steel Company; R. P. Smith, capitalist, and E. B. Entwisle, chief engineer of Lorain Steel Company.

The manufacturing plant is being completely equipped and will be of modern type. The forge shop is 125 feet long and 65 feet wide, and there is a die sinking shop 60 by 35 feet and two stories high. The machine specialty department is also 60 by 35 feet. The large forge shop is run by two separate power units, while each of the other departments has its individual power unit. Special roughing-out, breaking-down and board hammers have been installed for working nickel and chrome steels; the board hammers have been set close together so that reheating of these sensitive steels will not be required. Oil furnaces will be used for heating, and with these a very uniform temperature of any desired degree may be maintained—a matter of the utmost importance in working nickel and chrome steels. Trimming presses for hot-trimming the forgings are set close to the hammers, so that the work will leave the shop as close to size as possible. There are eleven hammers, varying from 150 pounds to a ton and a half, and a bender and an upsetter. Air compressors of the latest type have been installed, so that there will be ample blast on the dies to keep them clean and clear of scale and refuse. The excellent arrangements for making drop forgings of modern automobile steels of high tensile strength are particularly interesting.

This plant will, it is anticipated, be in active operation the latter part of August. Meantime the Cleveland plant is running day and night and taking care of orders promptly.

WARNER COMPANY ADDS A NEW LINE.

A new line of business has been taken up by a firm that has for some time been making cut-meters and automobile speed indicators—the Warner Instrument Company, of Beloit, Wis. The United States battleship *Georgia* is equipped with tachometers or revolution counters made by the Warner company to indicate the engine speeds, and these instruments are so delicately constructed that they are said to be capable of registering an angular speed as low as one-tenth of a revolution per minute. These instruments were built at the request of the chief engineer of the Bath Iron Works, where the *Georgia* was built; the engineer used a Warner speed indicator on his car and saw the possibility of using the same principle in a revolution counter.

Another instrument turned out by the same concern, especially for the government, is a wind-gauge made for the use of gunners in making allowance for windage on their projectiles. The new instruments are capable of registering the speed of a zephyr blowing at the rate of two miles an hour. The first order from the government called for 150 wind-gauges.

The new business has necessitated the erection of a new plant in Beloit, and a factory 100x200 feet will be put up. The location has not yet been chosen, but this and other details will be settled at an early date.

QUAKER CITY TRADE HAPPENINGS.

PHILADELPHIA, June 4.—The American car will be represented here by E. Warster, of the American Automobile Garage, at 933-937 North Seventh street, who last week secured the agency for Eastern Pennsylvania and South Jersey.

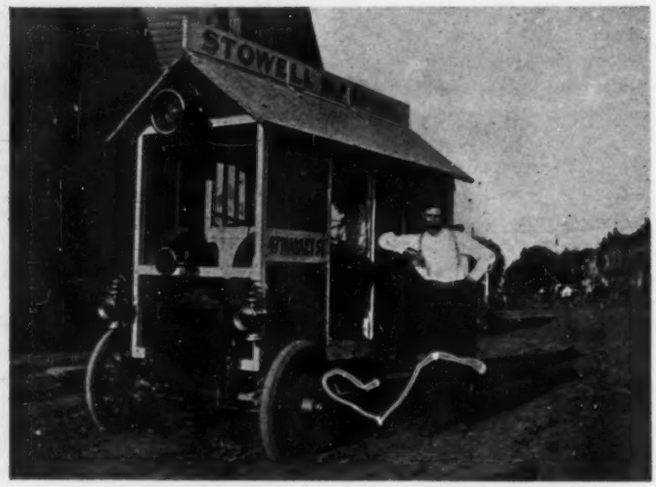
A sub-agency for the Queen car has been assigned by the Hamilton Auto Company, of this city, to Thurlow & Richardson, of Wilmington, Del.

So extensive will be the alterations required at the new quarters of the Rambler, at No. 207 North Broad street, that the changes amount to a practical rebuilding. The big three-story building, extending back to Watts street, will be devoted in its entirety to garage, repair, and salesroom purposes—the first floor having the salesrooms on the Broad street front, with offices separating them from the garage.

WILLIAM KELLY, DESIGNER, AND JESSE DRAPER, GENERAL SALES MANAGER, WAYNE AUTOMOBILE COMPANY, IN WAYNE 50-HORSEPOWER VANDERBILT CUP RACER.

AN ENTERPRISING WAY TO ADVERTISE.

Out on the roads of the West, in Iowa, the accompanying photograph of a novel advertising scheme was taken. The machine is an Oldsmobile and belongs to the Stowell Manufacturing Company, of Chicago, a branch of the Jersey City firm of that name. Manager Erringer, of the Chicago office, is responsible for the idea. The Stowell company manufac-



OLDSMOBILE CHASSIS FITTED WITH MODEL OF HOUSE.

tures roofing, and the little house on the car is made of the various kinds of roofing turned out. Making from four to eight towns a day, the car is an excellent advertising medium and attracts no end of attention along the route. This is the second season for the machine with its queer superstructure.

INDIANAPOLIS TRADE HAPPENINGS.

INDIANAPOLIS, IND., June 18.—Frank H. Wheeler, of Wheeler & Schebler, carbureter manufacturers, and Langsenkamp Brothers, brass foundrymen, of this city, have formed a partnership and will build one of the largest brass foundries in the country. A site has been purchased in the south part of the city, and a factory to cost not less than $125,000 will be erected and will occupy one-half block. The factory will be two stories high, and it is expected that by September 1 about 500 men will be employed in it. Wheeler & Schebler will move into the factory at the earliest possible moment. An alcohol carbureter and a motorcycle carbureter are said to be new productions for the near future. During 1907 it is said that about 150,000 carbureters will be manufactured.

An important deal in automobile circles has just been consummated here, whereby the Gibson-Short Cycle and Auto Company has obtained practially the whole State agency for the Leader cars, manufactured by the Columbia Electric Manufacturing Company, only five counties of the State being excepted. The Columbia Electric Manufacturing Company, incidentally, is making extensive preparations for 1907. The company is being reorganized, and it is said the factory will be removed from McCordsville to Noblesville, where a factory large enough to turn out one automobile a day will be installed. It is said that on September 1 the name of the company will be changed.

The Premier Motor Manufacturing Company is said to be making extensive experiments with aluminum, and it is said that this will enter largely into the manufacture of the 1907 Premier.

There was considerable astonishment here last week when it was announced that a special Lambert racing car manufactured by the Buckeye Manufacturing Company, of Anderson, had gone a mile on a half-mile circuit track in little more than 41 seconds. The report seemed accurate and was generally accepted. However, the correction has just been made that only the last half mile was timed, the time being 41 1-5 seconds.

DEALERS MUST KEEP A RECORD.

BOSTON, June 18.—In its new code of rules and regulations for the government of automobilists, which has been drafted and is now before the Governor and Council for their approval, the Massachusetts Highway Commission has included some very stringent provisions relating to the cars of manufacturers and dealers. In the past a dealer has been assigned a special number, which he was obliged to affix to all the cars in his charge, but he was not required to keep track of these machines in their goings and comings. The absence of any means of distinguishing the different cars belonging to any particular dealer, and the fact that the travels of his operators were not always known at the garage or salesroom, has caused considerable confusion when professional chauffeurs were charged with offenses against the speed laws. The new rules are designed to remedy this by requiring that the dealer or manufacturer shall tag his machines with a series of letters in addition to the register number, and shall keep a record of every car which goes out of or enters the garage.

New rules have also been made regarding the carrying of number plates on private as well as dealers' machines. To the rule which states that the plates must be so placed as to be "always plainly visible" is added, "to a person standing erect within twenty feet of or behind any part of said vehicle." To this rule is added also the following provision: "Both plates shall be parallel to the axles of the vehicle. The lower edge of each plate shall be parallel to the bottom of the body of the vehicle; provided, however, that no strap, rope, or any other thing shall be placed or located so as to cover, hide, or obscure the register number or any part thereof. The owner or person in control of any automobile shall use reasonable effort to keep the register number plates clean so that the numbers may be easily read."

A NEAT COMMERCIAL DELIVERY WAGON.

For several years the Hinde & Dauch Paper Company, Sandusky, O., has recognized that there was a growing demand for a commercial car, light in weight, strong and durable, as well as simple to operate, and one that could be marketed at a moderate price. With this in mind the company has pro-

CLIMAX LIGHT COMMERCIAL DELIVERY CAR.

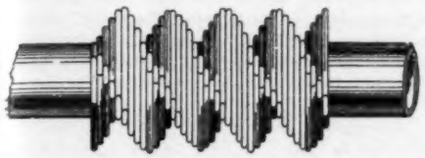
duced the Climax car, shown in the cut. It weighs 1,400 pounds and has ample power and strength to carry 1,000 with ease at a speed varying from four to twelve miles per hour. Quite a number of these cars are in successful operation throughout the country, every one of which, the makers state, is giving excellent satisfaction. The car is small and handy to operate, its weight is but little and its carrying capacity is sufficient for any service that could be handled by an ordinary horse-drawn delivery wagon.

Patents

Radiator Tube.

No. 822,372.—J. G. A. Kitchen and L. R. Perkins, of Lancaster, England.

This is a tube on which the radiating surface is supplied by a helix of wire or ribbon bent in angles substantially as indicated in



WIRED RADIATOR TUBE.

the end view, so that when slipped over the tube it will hold itself in place without soldering if desired.

Copper Water Jacket.

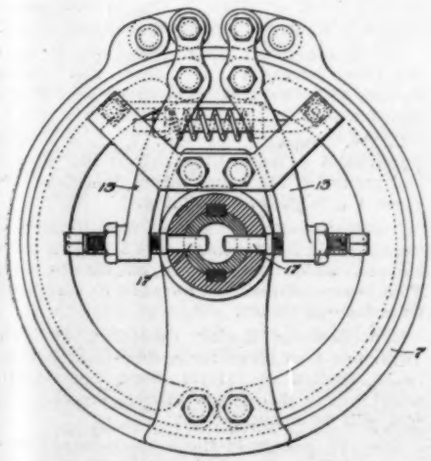
No. 822,326.—F. H. Tryon, of Utica, N. Y.

This is a copper jacket, made in sections suitably conforming to the shape of the cylinder and joined together by soldering or brazing.

Friction Clutch.

No. 822,454.—H. F. Hubbard, of Avalon, Pa.

The design of this clutch adapts it to



DOUBLE-ACTING BAND CLUTCH.

driving in either direction. It is of the contracting band type, and the band *7* is supported diametrically opposite the split. The two free ends of the band are drawn together by the levers *13 13*, whose ends are spread by a wedge (not shown) which slides in the hollow shaft and forces the adjustable pins *17* apart.

Mechanical Lubricator.

No. 822,900.—J. F. McCanna, of Chicago, Ill.

This is the well-known McCanna (or McCord) lubricator, differing from the usual form only in that the pump eccentric shaft is driven by a ratchet and pawl instead of by the usual worm and wheel.

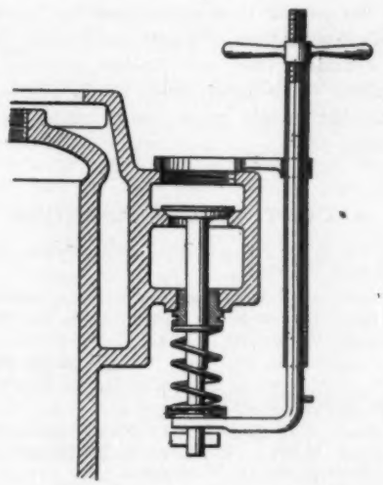
Detachable Tire.

No. 822,583.—James Christy, of Akron, Ohio.

This is a form of tire, having quick detachable flanges held on a flat rim by side clips secured by bolts passing transversely through the felly below the rim.

Tool for Removing Exhaust Valves.

No. 821,149.—G. J. E. Alphandéry, of Chaumont, France.



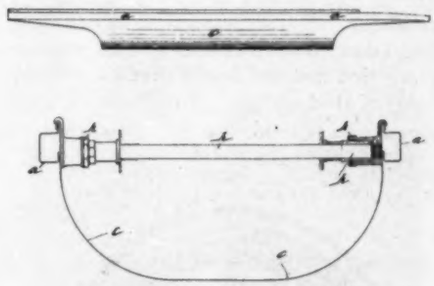
VALVE SPRING RELEASING TOOL.

This is a tool for compressing the exhaust valve spring to permit the easy removal, or the replacement, of the key in the exhaust valve stem. Its form and mode of operation are plainly shown in the drawing.

Automobile Frame.

No. 822,784.—J. Spyker, of Trompenburg, Netherlands.

In this device a sheet steel pan *c* is provided under the motor and transmission members, which are suspended from the cross bars *h* in the manner shown in the lower view. The lower view shows dia-



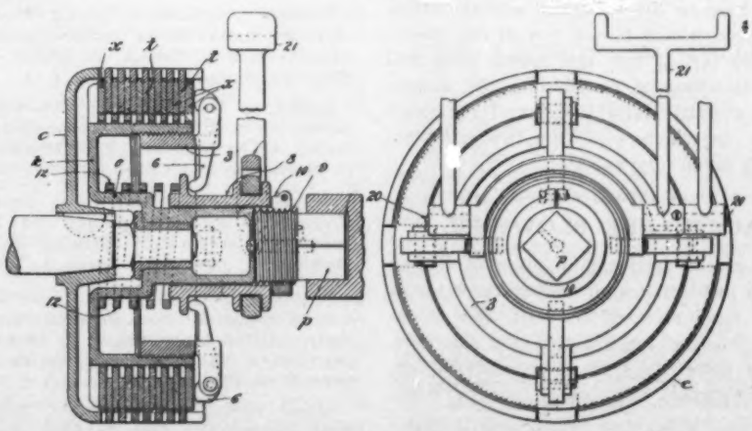
ANTI-DUST BODY DESIGN.

grammatically the section of the channel member *a* of the main frame, also the provision at *k* for adjustment of the length of the cross members *h*.

Multiple Disk Clutch.

No. 822,727.—J. F. Duryea, of Springfield, Mass.

This is a clutch designed so that the spring thrust is self-contained when the clutch is in action. Alternate clutch disks *t* are tongued to revolve with the shell *c*, and the others *x* with the barrel *k*. This barrel has a hub *o* which is prolonged and threaded at *9* close to its squared end *p*. When the clutch is in action the spring *12* presses against the sleeve *8* and forces the dogs *6* against the disks. A special feature of the clutch is the adjustable stop nut *10*, against which the sleeve *8* abuts when the clutch is engaged. The purpose of this is to limit the spring pressure which can be applied to the clutch disks, thereby allowing the clutch to slip when it is suddenly engaged, and pick up the load gradually. The force with which it presses the disks together may be adjusted by turning the ring *3*. The clutch is released by moving the foot lever *21* in the direction of the arrow. It is fulcrumed at *20*.



MULTIPLE DISK CLUTCH WITH SELF-CONTAINED SPRING THRUST.

STEEL SPRING TIRE.

The ever-interesting tire problem has been attacked in a somewhat novel manner by Charles Adsit, of Owoatonna, Mich., and the accompanying illustration shows the device. The Adsit tire is not a pneumatic, but makes use of steel springs to obtain the requisite resiliency. The outer covering is of rubber and fabric, much like the shoe of a pneumatic tire, and fits closely over an arrangement of steel springs. A false rim of wood

ADSIT STEEL TIRE AND SECTION.

with a rubber facing strip on its periphery is secured to the rim of the wheel, inside the tire, in such a way that the rubber strip acts as a buffer and prevents excessive compression of the springs under abnormally heavy shocks. The illustration shows a wheel fitted with the Adsit tire with the rubber covering removed and one section of steel spring taken out; also a section of tire and rim, which shows the construction more in detail.

To each side of the false rim is bolted a series of semicircular steel springs. The outer ends of the springs, which do not quite meet in the center, are bent to the form shown in the section; the ends are inserted in deep grooves formed in the edges of a spring steel hoop which passes entirely around the tire. The semicircular springs and the rubber outer covering are bolted to the base of the false rim and the latter is, in turn, bolted to the rim of the wheel. The idea is that the steel spring hoop will have the effect of distributing the weight among a considerable number of the small springs, in which work the rubber covering will materially assist.

ACETYLENE BLOWPIPE.

The use of acetylene in place of hydrogen for producing high temperatures seems not to have received the attention it deserves. There are claimed for this new heating flame, says the *Electrical Review*, some important advantages, one of them, at least, being of considerable practical value.

The oxyacetylene flame corresponds exactly to the old oxyhydrogen flame, except of course that acetylene is substituted for the hydrogen. Oxygen is generally obtained from a supply under pressure. It is said that under suitable conditions temperatures as high as 4,000 degrees Centigrade may be reached—a temperature which is surpassed only by that of the electric arc. Combined with this increase in temperature, it is claimed that it is as controllable as the oxyhydrogen flame, and can be used as a reducing or oxidizing agent, or simply as a neutral heating flame.

An advantage of this new flame, which will appeal to the workman, is the ease with which the necessary gases can be transported and generated. The acetylene is, of course, obtained from calcium carbide in any of the many types of generators. A high pressure is not needed, and while up to the present time the oxygen has usually been drawn from a supply compressed into a cylinder, there are to-day available a number of chemical agents which will yield this gas simply upon being treated with water.

RECENT INCORPORATIONS.

Colonial Automobile Co., Philadelphia, Pa.; capital, $25,000.

Cobe Auto Co., New York City; capital, $5,000. Directors: A. J. Cobe, H. H. Cobe and H. G. Kosch.

United Auto Co., New York; capital, $25,000. Directors: L. Ephraim, Henry Ephraim and Isaac Katzer.

Motor Car Livery Co., New York City; capital, $1,000. Directors: J. M. Keyser, O. H. Brown and O. W. Trannel.

Shaw-Brown Motor Co., Buffalo, N. Y.; capital stock, $15,000. Directors: Charles E. Shaw, Garnet G. Brown and William Hoddick.

Station American Automobile Co., New York; capital, $2,000. Directors: D. H. Gaines, Clifford Longley and S. H. Jones, all of New York.

Mount Morris Garage, Incorporated, New York; capital, $5,000. Directors: A. G. Ibbekin, F. W. Cattrell and M. H. Elser, all of New York.

Turner Motor Transfer and Trucking Co., New York; capital, $100,000. Directors: W. F. R. Turner, F. H. McConn and W. W. Cantwell, all of New York.

Western Automobile Racing Association, Chicago; capital, $2,000; promote speed trials. Incorporators: William D. Duval, Charles Weinfeld, Samuel A. Ettelson.

American Auto Company, Cleveland, O.; capital stock, $30,000. Incorporators: C. C. Sigler, Alfred L. Brown, J. S. Maxwell, Alex. C. Mackenzie and Charles E. Carpenter.

Franco-American Auto and Supply Co., Chicago; to manufacture and deal in automobiles. Incorporators: William T. Church, Howard W. Lewis and Lloyd A. Wicks.

American Automobile Co., Cleveland, O.; capital stock, $30,000. Incorporators: C. C. Sigler, Alfred L. Brown, J. S. Maxwell, Alexander C. Mackenzie and Charles E. Carpenter, of Cleveland.

Motor Vehicle Publishing Co., Ridgewood, N. J., publishers; capital, $10,000. Incorporators: Milton C. Richardson, Frank R. Whitten, Arthur A. Hill, James Sinton and Cornelius Doremus.

Knickerbocker Automobile Station Co., New York; to store and repair vehicles; capital, $25,000. Incorporators: Herbert L. Constable, C. F. William Reiss, and Louis A. Fehr, all of New York.

Concord Motor Car Co., Concord, Mass., to manufacture, lease and operate automobiles; capital, $10,000. President, John S. P. Alcott, Newton, Mass.; treasurer, F. Alcott Pratt, Concord, Mass.; clerk, John Edward Lavell, Boston.

Chesapeake Motor Car and Boat Co., Baltimore, Md.; capital stock, $25,000. Incorporators: Fred W. Taylor, Compton Reily and T. Reginald Wise, of Baltimore, and H. Egerton Riely and Alexander Gorrecella, of New York.

Automobile Outing and Transportation Co., Baltimore, Md.; to buy, sell and hire automobiles and deal in automobile supplies; capital stock, $50,000. Incorporators: Charles L. F. Harig, Reginald S. Opie, Lindsay C. Spencer, J. Q. H. Smith and Addison E. Mulliken.

THE GROWING GARAGE LIST.

H. G. Amick and Harold Davis will build a garage in Galien, O.

The Morris Motor Car Co., of Morris, Ill., has opened a garage on Liberty street, under the management of Durley McKeen.

A new garage for the Holmes-Booth Automobile Co., of Cleveland, O., is being erected on East One Hundred and Fifth street.

A garage has been opened on Church street, Portsmouth, N. H., by R. H. Beacham & Son, proprietors of a livery stable.

A large building in course of erection in Raleigh, N. C., will be used partly for a livery stable and partly for a garage.

The first garage in Biloxi, Miss., is being erected by G. B. Elder & Co., of that place. Cars will be stored, repaired, sold and rented.

The Rambler Co., of Philadelphia, is having plans prepared for a three story brick garage, 40 by 100 feet, to be erected on North Broad street.

C. W. Hopkins, of San Francisco, has established a motorcycle and tricar agency and garage at 729 Gough street, where he has erected a large new building.

J. W. Leavitt & Co., of San Francisco, have rebuilt their garage at 415 Golden Gate avenue, which was destroyed by the fire. This is one of the first garages to spring up from its own ashes.

The Rossiter Realty Company, of New York, has filed plans for a four-story garage to be erected at 147-151 West Forty-ninth street to run through to Fiftieth street. The cost will be about $80,000.

The new garage of the Acme Garage Company, of Tacoma, Wash., is nearly finished. The garage will be the largest in the city, having a floor space of 75 by 100 feet, and has been specially constructed for automobile work. The arrangements will be modern throughout.

NEW STAGE LINES.

Plans are on foot for the establishment of an automobile stage line between Rutherfordton and Asheville, N. C., to give a service of two trips daily.

Members of the Cleveland, O., City Council are endeavoring to arrange for an automobile transportation service in the city parks, part of the cost to be borne by the city. The privilege of carrying passengers in the parks is usually let to contractors each season. A five cent fare is favored.

NEWS AND TRADE MISCELLANY.

W. E. Brown has bought the controlling interest in the Tippecanoe Automobile Company, of Lafayette, Ind.

L. P. Moores has been appointed chief designer and mechanical engineer of the Moon Motor Car Company, of St. Louis.

The first eight cars that finished in the recent Italian Golden Cup endurance contest were fitted with Truffault-Hartford shock absorbers.

The Chicago branch of the Firestone Tire and Rubber Company has been removed from 550 Wabash avenue to 1442 Michigan avenue.

One of the largest single orders ever placed for automobiles was that given the Electric Vehicle Company by the New York Transportation Company for 50 Columbia broughams for delivery next fall.

Recent Washington converts to automobiling include Senator Scott of West Virginia and Baron Moncheur, the Belgian ambassador, both of whom have placed orders for Columbia electric victoria-phætons.

The American Automobile Company, Baum street, East Pittsburg, will build on the site occupied by the structure which recently collapsed, a brick garage, to occupy the space of 80 x 115 feet, with a second floor to extend back 40 feet.

Three and a half acres of land adjoining the plant of the C. H. Blomstrom Motor Company, at Detroit, Mich., has been purchased by that concern as a site for extensive additions to its manufacturing plant.

At the recent meet of the North Jersey Automobile Club at the Hohokus track, Eddie Bald, in a Columbia 24-horsepower, stripped touring car, drove a five-mile exhibition in 6:50, which is said to be record time for a half mile circular course.

The Anderson Machine Company, of Bedford, Ind., is now at work on an auto that is planned especially for the rural carriers. It is of the runabout type, two cylinder, 12 horsepower, planetary transmission and will cost $450.

The work of construction on the new factory of the White people on St. Clair avenue, Cleveland, is progressing rapidly. The walls of the factory building are up to the roof and the skylights are being laid. The buildings are of saw tooth construction, calling for glass skylights.

Commodore H. C. Roome has returned to northern waters with his yacht *Roamer*, and has gone in for automobiling. He has graduated from the runabout car, and has just purchased a 40-horsepower Lozier, which he is using at his summer home at Greenport, L. I.

T. F. Russell, who conducts an extensive manufacturing agents' business at 22-24 Lincoln street, Boston, has completed arrangements with the National Sales Corporation, of New York, to handle its line of Connecticut coils, Geecee storage batteries, "Soot Proof" plugs, and Dodge lubricators in Boston and surrounding territory.

A Maxwell-Briscoe touring car, driven by F. W. Peckham, of London, England, entered the recent Scottish reliability trials and came through with a clean score. The trip from London to Edinboro and return was made in 48 hours 16 minutes, running time, the distance being 800 miles for the round trip.

The handbook issued by the American Motor Car Manufacturers' Association gives illustrations and details of 77 different types of motor cars manufactured by the members of that organization. It also gives some interesting data regarding the association itself. Copies of the book can be had free by addressing the American Motor Car Manufacturers' Association, 29 West Forty-second street, New York.

In the issue of THE AUTOMOBILE of May 31, in the article describing the Kansas City Motor Car Company's new 6-cylinder car, it was stated that the works were located at Sheffield, Kansas. Sheffield is a suburb of Kansas City, and like Kansas City, is located in the State of Missouri.

An unusually heavy shipment of tires was recently sent by the Firestone Tire and Rubber Company, of Akron, Ohio, to the Ford Motor Company, of Detroit. The shipment consisted of a full carload of the new Firestone pneumatics, which will be used for the new Ford four-cylinder runabouts.

A special car conveyed 25 employees of the Detroit Auto Vehicle Company to Romeo, Mich., to witness the laying of the cornerstone of the new automobile factory which the company is building. The stone was laid by Miss M. E. Reid, the company's stenographer.

An involuntary petition has been filed against the Bender-Martin Company, No. 173 Lafayette place, New York City, by three creditors, the first claim being on assigned notes given to A. O. Baucker, amounting to $11,200. The other claims are for small sums.

The Delaware Auto Storage and Repair Company, of Wilmington, Del., has enlarged its garage, at Eleventh and West streets, giving the company about twice the room it formerly had. Several other local garages have also been enlarged recently, the development of the business having encouraged those who have engaged in it.

The Four-Wheel Drive Wagon Company of Milwaukee, Wis., has delivered a 7-ton truck to the Council Bluffs & Omaha Transfer Company. This is the first big car of that nature in use in the region of Omaha, and it will make four trips daily between that city and Council Bluffs, hauling a 5-ton trailer.

H. R. Palmer, of Cleveland, O., claims to have perfected a motor using crude oil for fuel. The motor is a 20-horsepower, with 6-inch bore and 5-inch stroke. The moving parts of the cylinder are insulated from the combustion chamber and it is claimed that it is unnecessary to provide facilities for cooling either by air or water.

The new factory building for the Weston-Mott Company, at Flint, Mich., is nearing completion. The work on the walls has already been finished and the roof is now well under way. The Weston-Mott Company, which has operated for years at Utica, N. Y., will remove to Flint about the middle of July, and will give employment to about 225 men.

The manufacturers of the Fawkes Airless Clincher Motor Tire state that they have received many communications from users of the Fawkes tire, agreeing that the device is not only unpuncturable, but is as resilient as a pneumatic tire. The Fawkes tire has an inverted V-shaped core of soft rubber, the space being filled with air, though not under pressure. The Fawkes tire is made by the Milwaukee Rubber Works, of Cudahy, Wis.

"Jack" Montgomery, manager of the local telephone office at Rensselaer, Ind., has been using an Orient buckboard in the work of keeping up his lines in the country district. He is able to reach the seat of trouble on any line in a short time, and to also inspect a large territory in the course of a working day. A touring party consisting of Mr. Montgomery, Delos Thompson, B. F. Fending, and Mr. Warren will make a tour in a White steamer from Rensselaer to Indianapolis, thence through the larger cities of central Ohio to Pittsburg, Pa., and will return home through northern Ohio and southern Michigan, stopping at Detroit.

PERSONAL TRADE MENTION.

Edmund Buchanan, a member of the firm of Callahan, Atkinson & Co., of Baltimore, has removed to New York, in which city he will henceforth make his residence.

John Milliken, formerly with the Electric Vehicle Company of Hartford, has become the general manager of the Automobile Outing & Transportation Company of Baltimore.

Hiram E. Weaver, proprietor of one of the leading garages of Portsmouth, N. H., has disposed of his business to accept a position with one of the leading Boston automobile houses.

George W. Browne, for the past two years with Holmes Schmidt Company, of Chicago, has joined the selling forces of C. A. Coey & Co., representatives of the Thomas Flyer in that city.

John E. Fry, formerly manager of the Chicago branch of the Apperson Brothers' Automobile Company, is now treasurer and general manager of the Consolidated Supply Company of Denver, Col.

J. L. Aikenhead, of New York, has succeeded A. E. Hoffman as manager of the Philadelphia branch of the Ford Motor Company. Mr. Aikenhead has for some time been connected with the New York branch, and his appointment is in the line of a well-deserved promotion.

Henry J. Hill, who has severed his connection with the Electric Vehicle Company of Hartford, was the recipient of a handsome 32d degree Masonic charm, which was presented to him by his associates June 9, the date upon which his resignation as master mechanic of the factory took effect. Mr. Hill has been connected with the Electric Vehicle Company for ten years, and was universally popular among his associates.

NEW AGENCIES ESTABLISHED.

The Pope-Toledo is now represented in Indianapolis by Frank A. Beck, 719-721 North Illinois street.

The Pope Motor Car Company, of Toledo, will hereafter be represented in Pittsburg, Pa., by the Auto Repair Company of that city.

The Gibson-Short Cycle & Auto Company, of Indianapolis, Ind., has completed arrangements for the agency for the Premier and Wayne cars.

The Porter-Cable Machine Company, of Syracuse, N. Y., manufacturers of automobile jacks, have contracted with Patterson, Gottfried & Hunter, of 146-150 Center street, New York, for the exclusive sale of their product.

LATE SPECIALTIES OF THE TRADE.

CONTINENTAL SEARCHLIGHTS. — Good lamps are an essential part of the equipment of every automobile, for going it blind at night is neither safe nor pleasant and poor lamps are very unsatisfactory things. A line of lamps intended to fill the demand for high-class articles is handled by the Motor Car Equipment Company, of 55 Warren street, New York. These lamps

CONTINENTAL GAS HEADLIGHT.

are fitted with Mangin mirror lenses, and they will project their light twelve hundred feet, it is stated. Two styles are made, one with a swivel bracket to be attached to the dashboard of the car and having a handle at the back to direct the beam of light in the desired direction, and the other arranged for a rigid fork support. The bodies are made of heavy brass, highly polished, with copper trimmings. These are known as the Continental lamps.

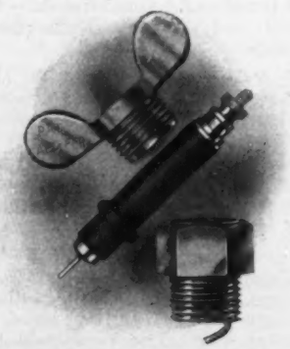
MONARCH RUNABOUT.—A number of important improvements have been made in designing the Monarch runabout, manufactured by the Monarch Motor Car Co., of Chicago. The single-cylinder air-cooled engine has been replaced by a double-cylinder horizontal air-cooled engine of 12 horsepower, driving through planetary transmission, propeller shaft and bevel gears to the live rear axle. The wheels are made either 28 inches or 32 inches in diameter, and are fitted with 3-inch tires instead of the 2 1-2-inch tires formerly used. Front wheels run on ball bearings and the rear axle on roller bearings. The spring arrangement used last year is retained, and consists of long side springs of the well-known type supplemented by inverted side springs, the lower springs carrying the engine and other mechanism and the body riding on the upper springs, so that the engine vibration is absorbed to a great extent before reaching the body. The body is of the piano-box type in the runabout, and is finished in black. Other styles of body are also built. The car is said to be capable of traveling 25 miles an hour.

AN AUTOMOBILE DICTIONARY.—Those who tour abroad or have occasion to read and translate matter relating to automobiles and automobiling published in French and German, should find of considerable value a little book of pocket size called "Krausz's Practical Automobile Dictionary," which has just been published by the Frederick A. Stokes Company, of New York. This gives in three parallel columns to each page the English, French and German equivalents of terms commonly used in connection with automobiles, including, in addition to the strictly technical terms, words often employed in touring. The dictionary was compiled by Sigmund Krausz, manager of the foreign department of the H. H. Franklin Manufacturing Company, from information culled from technical publications, catalogues and sport reports, and was brought out to meet the difficulty of finding proper translations of technical motoring terms.

NEW SPARK PLUG.—These are days of progress in the matter of the details of automobile equipment, and that one-time troublesome member, the spark plug, has received its full share of attention. One of the latest designs is illustrated herewith, and is made by the Charter Manufacturing Company, of 303 Dearborn street, Chicago, Ill., under the name of the Charter spark plug. The main feature of the plug is the wing-nut which forms the upper section of the shell, and by which the parts are held together. Once the plug has been screwed

CHARTER MICA SPARK PLUG.

into the cylinder, a wrench is not necessary, for by unscrewing the wing-nut, which can easily be done by hand, the central insulated core, carrying the insulated electrode, can be withdrawn and cleaned, if necessary, or a new one can be inserted. The central sparking point does not change its position if the electrode is turned, so



CHARTER PLUG TAKEN APART.

that the adjustment of the spark gap is not altered by successive removals and replacements. The shell and other metal parts of the plug are of polished brass, so that there is of course nothing to rust. The insulation is of mica, and is double. The inner layer is of strip mica wound on the central rod, while the outer layer consists of a large number of mica washers, forced over the mica winding by hydraulic pressure. The Charter plug is made with standard or metric thread, half inch size, and all parts are interchangeable. Joints are ground to fit and require no gaskets.

A GOOD GOGGLE.—In the accompanying illustration is shown a new idea in goggles for automobilists. These are called the Perfection goggles and are manufactured for Charles E. Miller, of 97 Reade street, New York. As may be seen, the glasses are of special elongated form, so as to give a view sideways, the glass being curved

MILLER'S PERFECTION GOGGLES.

to help in this direction. The frame is curved to fit the contour of the wearer's head, and is nickel-plated; the covering, which is large enough to protect the eyes without covering much of the face, is of kid, and may be had in a variety of colors. An elastic band of adjustable length holds the goggles on.

CATALOGUES RECEIVED.

REO MOTOR CAR COMPANY, LANSING, MICH.—Pamphlet of testimonials entitled "The Car That Does."

AUTOMOBILE BUYERS' ASSOCIATION, NEW YORK.—Catalogue of automobile accessories at very moderate prices.

RAPID MOTOR VEHICLE CO., PONTIAC, MICH.—Catalogue of gasoline commercial vehicles, with detailed description of chassis.

WARNER POLE AND TOP COMPANY, CINCINNATI.—Illustrated catalogue of automobile tops, lamp covers, tire cases and the like.

AUTO ACCESSORIES MANUFACTURING COMPANY, DETROIT, MICH.—Illustrated catalogue of a very complete line of automobile accessories.

PATTERSON, GOTTFRIED & HUNTER, LIMITED, NEW YORK.—Catalogue No. 60; a very complete catalogue of all kinds of bolts, nuts and screws.

BARRETT MANUFACTURING COMPANY, NEW YORK.—Handsome illustrated booklet describing Tarvia, a preparation for dust-laying and binding road surfaces.

ORLANDO F. WEBER COMPANY, CHICAGO.—Pamphlet embodying descriptions of the Pope automobiles and also describing the Weber service. This pamphlet is a novelty in its way.

PAGE-STORMS DROP FORGE CO., SPRINGFIELD, MASS.—Catalogue of drop forged wrenches and spanners; also crankshafts and other motor parts and a variety of special forgings.

DUFF MANUFACTURING COMPANY, PITTSBURG, PA.—Illustrated catalogue of Duff roller bearing jacks for all classes of service. This concern also makes the well-known Barrett jacks.